Digitized by the Internet Archive
in 2015

https://archive.org/details/facultyseminarmu00bonn

KENTUCKY DEPARTMENT OF EDUCATION
OFFICE OF EDUCATION FOR EXCEPTIONAL CHILDREN

Faculty Seminar
May 12-13, 1986

Natural Bridge State Park

Monday, May 12

9:00 am	Registration, Coffee
9:30 - 11:30 am	Overview and Characteristics of the MHSI Child Bonnie Utley University of Pittsburgh
11:30 am - 1:15 pm	LUNCH
1:15 pm - 2:45 pm	Functional Vision--Observation and Assessment Bonnie Utley
2:45 pm - 3:00 pm	BREAK
3:00 pm - 4:30 pm	Functional Vision--Programming Considerations Bonnie Utley

Tuesday, May 13

8:45 am	Coffee
9:00 am - 10:20 am	Functional Hearing--Observation and Assessment Bonnie Utley
10:20 am - 10:30 am	BREAK
10:30 am - 11:45 am	Functional Hearing--Programming Considerations Bonnie Utley
11:45 am - 1:15 pm	LUNCH
1:15 pm - 2:45 pm	Language and Communicative Intent; Receptive Cuing Systems Debbie Knapp
2:30 pm - 2:45 pm	BREAK
2:45 pm - 3:30 pm	Expressive Communication; Programming Debbie Knapp
3:30 pm - 4:15 pm	Group Discussion--Implications for University Programs
4:15 pm - 4:30 pm	Wrap-up and Evaluation

Faculty Seminar

The Multihandicapped Sensory Impaired Child

Bonnie Utley
University of Pittsburgh
Department of Special Education
Project PREP, Western Psychiatric Institute and Clinic
121 University Place
Pittsburgh, PA 15213
(412) 624-1703 or 624-0215

Participants	
Hilda Caton	University of Louisville
Cinda Christensen	Office of Education for Exceptional Children
Don Cross	University of Kentucky
Sue Enoch	Kentucky School for the Blind; University of Louisville
Dave Gast	University of Kentucky
Carol Ann Georges	Morehead State University
Jon Green	Eastern Kentucky University
Sharon Guiltinan	Jessamine County Schools; SPLASH; University of Kentucky
Preston Lewis	Office of Education for Exceptional Children; SPLASH
Pam Smith	University of Kentucky
John Vokurka	Western Kentucky University
Earl Zehr	Cumberland College

UK Deaf-Blind Program	
Nancy Berger	Lexington--(UK)
Alice Buchanan	Louisville--(KSB)
Debbie Knapp	Lexington--(UK)
Marie Ruf	Louisville--(KSB)

KENTUCKY DEPARTMENT OF EDUCATION
OFFICE OF EDUCATION FOR EXCEPTIONAL CHILDREN

Faculty Seminar
May 12-13, 1986

THE MULTIHANDICAPPED SENSORY IMPAIRED CHILD

Reference Manual

Topic: Functional Vision

Vision Assessment and Program Manual for Severely Handicapped and/or Deaf-Blind Students
Developed by the Bay Area Severely Handicapped Deaf-Blind Project, San Francisco State University, 1980. Bonnie Utley, Lori Goetz, Kathy Gee, Marylud Baldwin, Phillip Hatlen, Wayne Sailor.

Topic: Functional Hearing

Auditory Assessment and Programming for Severely Handicapped and Deaf-Blind Students
Developed by the Bay Area Severely Handicapped Deaf-Blind Project, San Francisco State University, 1981. Lori Goetz, Bonnie Utley, Kathy Gee, Marylud Baldwin, Wayne Sailor.

Topic: Prelinguistic Communication

Communication Development in Young Children with Deaf-Blindness: Literature Review I.
Deaf-Blind Communication Skills Center, Teaching Research Division, 1985.

"The Selection of an Augmentative System of Communication Intervention: A Critique of Decision Rules." Joe Reichle and George Karlan (JASH, 1985, Volume 10, Number 3, 146-156).

"Receptive Tactual Cues." Kathleen Stremel-Campbell, Deaf-Blind Communication Skills Center, Teaching Research Division. Handout, 1985.

"Cued Commands Chart." Programmed Environments Curriculum. James W. Tawney, Deborah Knapp, Carol O'Reilly, Sandra Pratt. Charles E. Merrill, 1979.

"The Use of 'Symbol Shelves' in Teaching Communication with Multihandicapped Children". Ann Silverrain. Education Service Center, Region 20, San Antonio, Texas, 1982.

"Teaching Time Concepts Through Use of Concrete Calendars." Robbie Umholtz and Dale Rudin. Texas School for the Blind, 1981.

"Non-Verbal Prelinguistic Communication: A Guide to Communication Levels in Prelinguistic Handicapped Children". Maurine Otos, Oregon Department of Education, 1983.

"Analyzing the Communicative Functions of Aberrant Behavior". Anne Donnella, Patricia Mirenda, Richard Mesaros, Lynette Fassebender. JASH, 1984, Volume 9, Number 3, 201-212.

"Activiites That Promote Communication in Low-Functioning Multihandicapped Children". Ann Silverrain. Education Service Center, Region 20, San Antonio, Texas, 1983.

"A Prelanguage Program for the Multihandicapped Based on the Van Dijk Approach" and "Interrelating Van Dijk and Piaget". Colorado School for the Deaf and Blind, 1978.

"Communication Placement Assessment". Communication Curriculum. Kathleen Stremel-Campbell, Nancy Johnson-Dorn, Judy Guide, Tom Udell. Teaching Research Integration Project for Children and Youth with Severe Handicaps, 1984.

"ICS - Skills to be Taught". Individualized Curriculum Sequence and Extended Classroom Models for Learners Who Are Deaf and Blind. Edwin Helmstetter, Mariangeles Murphy-Herd, Sally Roberts, Doug Guess. Curriculum Development Project for Secondary Age Severely Handicapped Deaf-Blind Students. University of Kansas, 1984.

REFERENCES FOR THE ICS MODEL

Mulligan, M., Guess, D., Holvoet, J., & Brown, F. (1980). The individualized curriculum sequencing model (I): Implications from research on massed, distributed, or spaced trial training. Journal of the Association for Persons with Severe Handicaps, 5, 325-337.

Holvoet, J., Guess, D., Mulligan, M., & Brown, F. (1980). The individualized curriculum sequencing model (II): A teaching strategy for severely handicapped students. Journal of the Association for Persons with Severe Handicaps, 5, 337-352.

Brown, F., Holvoet, J., Guess, D., & Mulligan, M. (1980). The individualized curriculum sequencing model(III): Small group instruction. Journal of the Association for Persons with Severe Handicaps, 5, 352-368.

Gaylord-Ross, R., & Holvoet, J. (1985). Strategies for educating students with severe handicaps. Boston: Little, Brown, and Company.

Guess, G., & Helmstetter, E. (1986). Skill cluster instruction and the individualized curriculum sequencing model. In, R. Horner, L.H. Meyer, and H.D. Fredericks (Eds.), Education of learners with severe handicaps. Baltimore: Paul H. Brookes Publishing.

Sheet

STUDENT ____________________

STEPS	DATES										FREQUENCY CORRECT
	15	15	15	15	15	15	15	15	15	15	
	14	14	14	14	14	14	14	14	14	14	
	13	13	13	13	13	13	13	13	13	13	
	12	12	12	12	12	12	12	12	12	12	
	11	11	11	11	11	11	11	11	11	11	
	10	10	10	10	10	10	10	10	10	10	
	9	9	9	9	9	9	9	9	9	9	
	8	8	8	8	8	8	8	8	8	8	
	7	7	7	7	7	7	7	7	7	7	
	6	6	6	6	6	6	6	6	6	6	
	5	5	5	5	5	5	5	5	5	5	
	4	4	4	4	4	4	4	4	4	4	
	3	3	3	3	3	3	3	3	3	3	
	2	2	2	2	2	2	2	2	2	2	
	1	1	1	1	1	1	1	1	1	1	

PROGRAM CHANGES ____________________

ASSESSMENT SCALES FOR USE WITH CHILDREN AND ADULTS WHO ARE DEAF-BLIND

DEVELOPMENTAL SCALES

Stillman, R. (1978). The Callier-Azuza Scale.

Available from: The South Central Regional Center for
Services to Deaf-Blind Children
2930 Turtle Creek Plaza
Suite 207
Dallas, Texas 75219

or

Callier Center for Communication Disorders
1966 Inwood Road
Dallas, Texas 75235
(214) 783-3106

Audience: Preschool and elementary age students.

BEHAVIORAL CHECKLISTS

Becker, H., Schur, S., Paoletti-Schelp, M., & Hammer, E. (1982). Functional Skills Screening Inventory.

Available from: Functional Resources Enterprises
2734 Trail of the Madrones
Austin, Texas 78746

* Please note that this exceptionally good assessment system is available in the form of computer programs as well as in print. Both IBM and Apple IIe are available at a cost of $380.00 and $340.00 respectively. The print edition is available for $46.00.

Audience: Preschool through adulthhod.

Collins, M.T. & Rudolph, J.M. (1975). A Manual for the Assessment of a Deaf-Blind Multiply Handicapped Child.

Avaiable from: Midwest Regional Center for Services to
Deaf-Blind Children
Michigan Department of Education
P.O. Box 30008
Lansing, Michigan 48909

Audience: Preschool through adulthood.

Song, A.Y. & Jones, S.E. (1980). Wisconsin Behavior Rating Scale.

Available from: Central Wisconsin Center for the
Developmentally Disabled
317 Knutson Drive
Madison, Wisconsin 53704

Audience: Preschool through adulthood.

To be used in conjunction w/ Bay Area materials

Faculty Seminar

Overview Characteristics
38% D/B pop. found: CA, NY, OH, NJ, MI

Newer etiologies f/ D/B (RNA Duplicating viruses)
TO-Toxoplasmosis
R- Rubella
C- Cytomeglovirus (CMV)
H- Herpes

Encephalitus/meningitis-another etiology
Neonatal intensive care-another etiology

Functional level of pop.

2/3's-TMR or lower
88% have residual hearing and/or vision
A. More likely to have residual vision

Learning characteristics
A. Similar to a VI child
    a. High self stim.-attempt to replace visual input child is not getting
    b. Reduction in exploratory behaviors
    c. Tactile defensiveness
B. Poor communication
C. Poor Social develop
D. Poor Motor develop

Curriculum Model
Individual Curriculum Sequencing (ICS)
A. Concurrent vs Serial Training
    ex-a. Pool of stimuli such as motor imitation
    1. Teach a variety of activities at one session (concurrent)-preferred method
    2. Teach each activity to criterion and move to next activity (serial)

ICS Model and Alternative to Traditional Objective
A. Training trials are distributed or spaced rather than massed
B. Teaching schedule differs
C. Teaching environments differ
D. Translation of assess. info into objectives differs
E. The selection of materials differ.

Application of ICS Model
A. Communication
B. Visual motor-attention skills
C. Motor skills
    a. Transition Behaviors
    b. Protective Reactions
D. Behavior Management

Grp. Instruction Advantages
A. Efficient
B. Provides opportunity for observational learning

C. Provides opportunity for students to model appropriate behaviors for each other
D. Generalization to natural environment.
ex.-tolerating people in close proximity, turn taking

Application ICS f/ grp. instruction

I. Intra-sequential training
  - a. Different programs, different themes (clustered, individualized instruction)
  - b. Different programs, same theme
  - c. Same program, same theme

II. Inter-sequential training
  - a. Interaction between students in the grp. ex.-sharing materials, peer relationships, name recognition of peers.

Functional Vision

A. Blink reflex
  - a. Stimulus-open hand
  - b. Practice the procedure on a person w/ normal vision so you have a baseline for what range of normal is.
  - c. Reflexive responses do not require active student participation

Physical involvement and implications

I. Assymetrical Tonic Neck Reflex (ATR)-not uncommon to see gaze to extensor (straight) side. Tone related reduction in occular motility.
  - A. Suggest good relation and tone and turn head all the way to the opposite side and then back to midline.
  - B. Extensor Tone-Tonic deviation gaze upward
  - C. Athotoid (Fluctuating tone) Disassociated Gaze. Gaze does not always change as head movement changes.

Lid opening Reflex-Movement to an upright. Ocular vestibular reation, sitting position. Stimulates more alert responses.

Programming Considerations

A. Seeing vs looking
  - a. Seeing-light coming into eye
  - b. Looking more attentionally related.
    - 1. More imp. of the 2

B. Light training
  - a. Done in a darkened room rather than under normal lighting conditions
  - b. Materials used should be useful and practical.
  - c. Supply light source to room on reostat

C. Using auditory toys require visual behavior

D. Vision Programming
  - a. Compensation
  - b. Remediation
  - c. Adaptation

Auditory Assessment

I. Characteristics of sound
  - A. Intensity (d.B.) one measure of sound
    - a. Interpreted as "loudness"
    - b. Volume of air particles set into motion by sound
  - B. Frequency-pitch (HZ)

II. Hearing Loss
  A. Conductive-Outer portion of or inner ear effect as sounds do not travel down ear canal or does not properly translate into sound once it gets to inner ear. Often correctable (ex. otitis media)
  B. Sensori-neural loss-(inner ear)
  C. Etiology
    a. TORCH Syndromes
    b. Antibiotics
    c. Aspirin (temporary)

III. Informal assessment of hearing
  A. BOA (Behavior Observation Audiometry)
    a. Questionable Reliability
    b. 3 classes of sounds assessed
      1. Speech sounds
      2. Environmental Sounds
      3. Noisemakers
  C. Formats f/ BOA assessment
    a. Sound presented from behind by instructor at about a 45^{o} angle to ears.
    b. Tape sounds w/ 15 second intervals between sounds. Sounds should be presented at 70-90 dB.

IV. Formal Audiological Assessment
  A. Operant Motor Response (OMR)
    a. Play Audiometry
  B. Visually Reinforced Localization (VRL)

University of Pittsburgh

SCHOOL OF EDUCATION
Department of Special Education

RESOURCES

PARENT TRAINING

Ferrell. K.A. *Reach out and teach*
Consultant in Early Childhood Special Education
American Foundation for the Blind
15 W. 16th Street
New York, NY 10011

PROGRAM DEVELOPMENT

Efron, M. & DuBoff, B.R. *A vision guide for teachers of Deaf-Blind children.*
South Atlantic Regional Center for Services
to Deaf-Blind Children
Division for Exceptional Children
North Carolina Department of Public Instruction
Bunn-Hatch Building
Hillsboro Street
Raleigh, NC 27611

Harley, R.K., Wood, T.A., & Merbler, J.B. *Peabody Mobility Kits* ($150.00)

and

Harley, R.K., DuBose, R.F. & Baurgeault, S.E. *Peabody Model Vision Project* ($75.00)
Stoelting Co.
1350 S. Kostner Avenue
Chicago, IL 60623

BIBLIOGRAPHY: FUNCTIONAL VISION ASSESSMENT

for Preschool Visually Impaired Children
(Birth to Six Years)

Compiled by: Deborah Gleason
Preschool Services, Perkins School for the Blind

Look at Me: A Resource Manual for the Development of Residual Vision in Multiply Impaired Children
Audrey J. Smith and Karen Shane Cote
Pennsylvania College of Optometry Press
Philadelphia, PA 1982

A useful functional vision assessment for multiply handicapped and young children; covers basic visual skills without going into detailed assessment of more advanced visual-motor or visual-perceptual skills; fairly easy to administer; helpful as an initial assessment, with further evaluation of more advanced visual skills as needed. The manual also includes chapters covering anatomy of the eye, basic optical principles, common eye disorders and diseases, and a vision stimulation sequence (includes lessons, materials, etc.) which follows along with the assessment. An excellent overview of functional vision evaluation and related optical considerations.

Peabody Functional Vision Inventory for the Multiple and Severely Handicapped
C. H. Stoelting Company
424 North Homan Avenue
Chicago, Illinois 60624

This assessment goes into more detail than the "Look at Me" evaluation and requires further testing expertise. (It is recommended that two people perform this assessment, one to administer items, one to observe). Items are included in the following categories: structural defects/behavioral abnormalities, reflexive reactions, eye movement, near vision, distance vision, visual field preference, and visual perception. In addition, introductory material relating to major ocular impairments, a glossary of terms, and activity guidelines with lessons corresponding to the assessment are included.

A Vision Guide for Teachers of Deaf-Blind Children
Marvin Efron, O. D., Ph.D., and Beth Reilly Duboff, M.A.
South Atlantic Regional Center for Services to Deaf-Blind Children, 1976
Available from: Region I Center for Services to Deaf-Blind Children
(on loan only) 175 North Beacon Street
Watertown, Massachusetts 02172

or

Available from: South Atlantic Regional Center for
Services to Deaf-Blind Children
Division for Exceptional Children
North Carolina Department of Public Instruction
Raleigh, North Carolina

Price: $.75

Many ideas and techniques for assessing the visual functioning in deaf-blind children, particularly within the classroom setting, are discussed. Resource material related to vision, testing terminology, etc., is also included in this handbook.

Program to Develop Efficiency in Visual Functioning: Diagnostic Assessment Procedure and Design for Instruction

American Printing House for the Blind, Inc.
1839 Frankfort Avenue
Louisville, KY 40206

$182.50 for complete kit; several components available separately The purposes of this program are to provide a means to evaluate the level of visual functioning in low vision persons and to train such persons to use their vision more efficiently. This assessment is appropriate for children with cognitive functioning of at least three years. Suggested lessons (including needed pictorial materials) which correspond to the assessment items are also included. The Source Book on Low Vision contains a wealth of background material on low vision.

Stycar Vision Tests

Mary D. Sheridan, 1976
Published and Distributed by: The NFER-Nelson Publishing Co., Ltd.
Darville House
2 Oxford Road East
Windsor, Berks SL4 1DF
England

Also available from: Institute of Psychological Research
34 Fleury Street West
Montreal, Quebec H3L 9Z9
Canada

Contains several methods of testing distant vision in children ages 2-7 or multihandicapped (miniature toys test, Panda test); also includes graded balls test (for 6 months - 2½ years) and mounted ball test. The complete kit costs approximately $150.00, but components may be purchased separately. This is more of a formal than functional vision assessment.

Motor-Free Visual Perception Test

Academic Therapy Publications
1539 Fourth Street
San Rafael, CA 94901

This assessment is designed for children functioning from 4-8 years of age. Visual perceptual abilities assessed include: figure-ground, visual discrimination, visual memory, visual closure, and spatial relationships. The test was standardized on physically handicapped children. The child identifies black and white geometric and letter-like forms.

Understanding Low Vision

Randall T. Jose, Editor
University of Houston College of Optometry C 1983

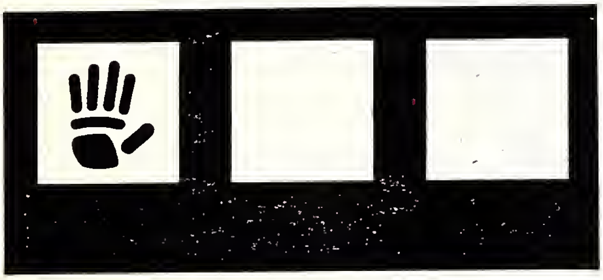
Available from: American Foundation for the Blind
15 West 16th Street
New York, N.Y. 10011

This is a useful reference book which provides a comprehensive overview of low vision assessment and services, including the functional implications of low vision. The following areas are covered: understanding low vision; assessment of low vision; clinical services; training and instructional services; and special considerations.

Visual Acuity Tests for Persons with Severe Handicaps

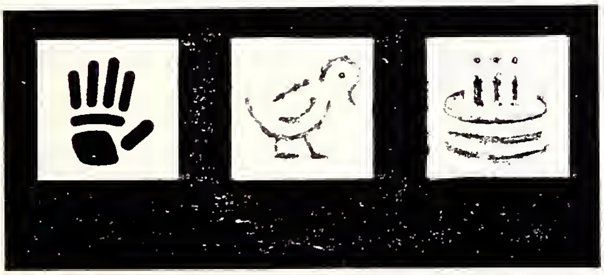
Test	Type of Response/Symbol	Commercial Outlet
Lippmann HOTV	label or match letters: "H," "O," "T," and "V"	Good-Lite Company 7426 W. Madison Street Forest Park, IL 60130
Lighthouse Flashcard	label or match pictures: house, umbrella, and apple	New York Association for 111 E. 59th Street New York, NY 10022
Dr. Pepper Test	label or match shapes: circle, square, and triangle	Drs. Pepper and Stahl 320 'a' Avenue Lake Oswego, OR 97034
Parsons Visual Acuity Test (PVAT)	point to or match pictures: hand, cake, and bird	Bernell Corporation 422 E. Monroe Street South Bend, IN 46601

Visual Acuity Tests Chart reprinted from: The Association for Severely Handicapped Journal, Vol. 6, Fall, 1981; "Vision Screening for Persons with Severe Handicaps", P. Cress, C. Spellman, T. DeBriere, A. Sizemore, J. Northam, J. Johnson

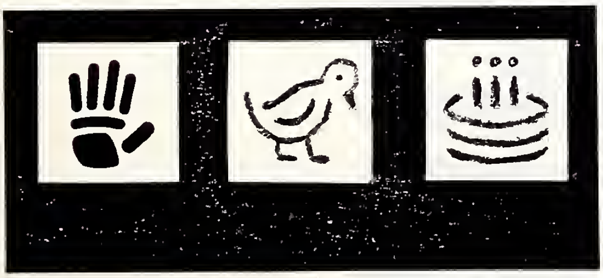


1

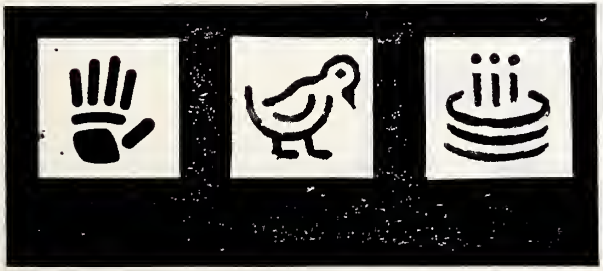
2



3



4



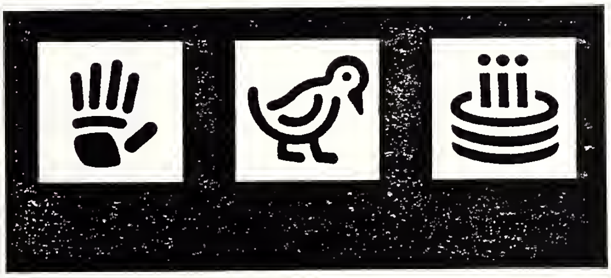
5

6

7

8

9



10

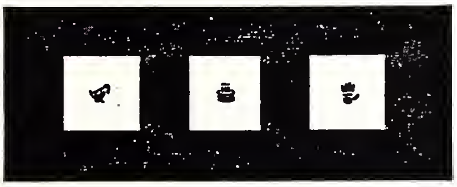
on's Near Point Acuity TEST

[illegible]

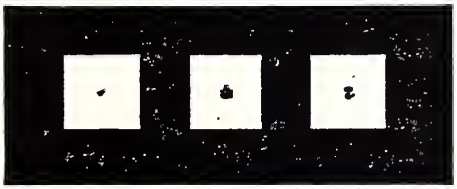
[illegible]

[illegible]

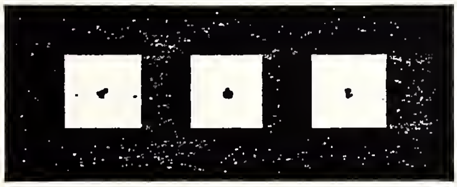
[illegible]



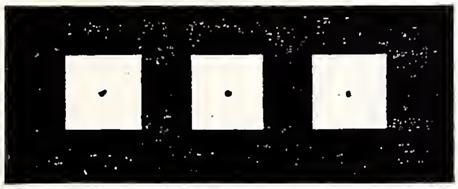
[illegible]



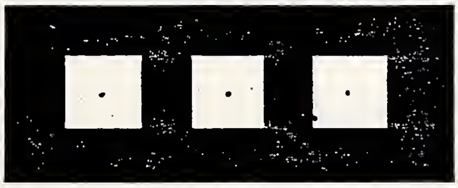
[illegible]



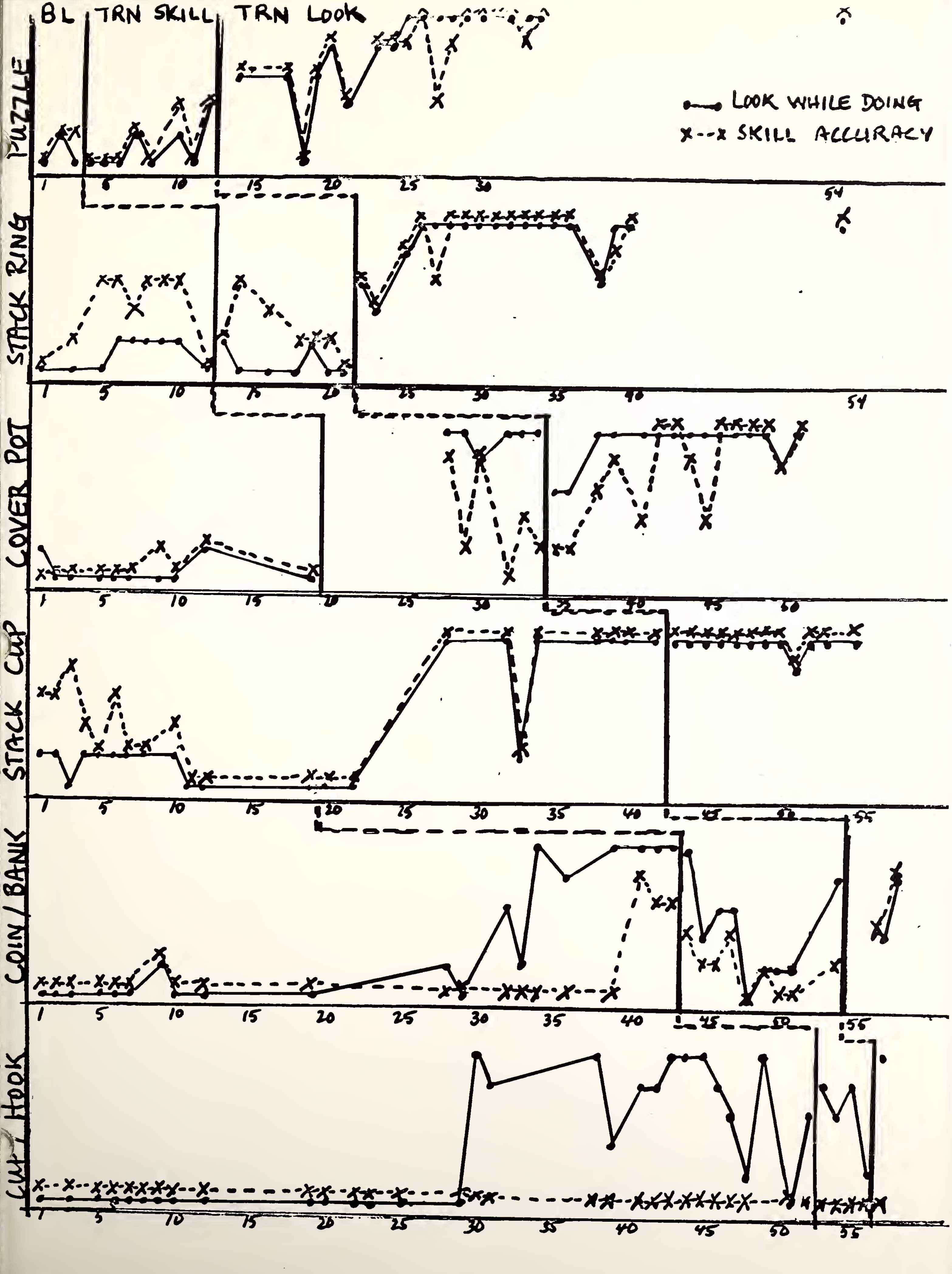
[illegible]



[illegible]



[illegible]


BL
TRN SKILL
TRN LOOK
●—● LOOK WHILE DOING
X--X SKILL ACCURACY
PUZZLE
1
5
10
15
20
25
30
54
STACK RING
1
5
10
15
20
25
30
35
40
54
COVER POT
1
5
10
15
20
25
30
35
40
45
50
STACK CUP
1
5
10
15
20
25
30
35
40
45
50
55
COIN/BANK
1
5
10
15
20
25
30
35
40
45
50
55
CUP/HOOK
1
5
10
15
20
25
30
35
40
45
50
55

ADDITIONAL REFERENCES
FOR SENSORY ASSESSMENT

Kukla, D., & Connolly, T.T. (1978). *Assessment of auditory functioning of deaf-blind/multi-handicapped children*. Dallas: South Central Regional Center for Services to Deaf-Blind Children.

Goetz, L., Gee, K., Baldwin, M., & Sailor, W. (1982). Classroom-based sensory assessment procedures for severely handicapped students: Case studies of a stimulus transfer paradigm. *Analysis and Intervention in Developmental Disabilities*, *2*, 171-185.

Cress, P., Spellman, C., DeBriere, T., Sizemore, A., Northam, J., & Johnson, J. (1981). Vision screening for persons with severe handicaps. *Journal of the Association for Persons with Severe Handicaps*, *6*, 41-51.

REFERENCES FOR VAN DIJK
COMMUNICATION STRATEGIES

Sternberg, L., Battle, C., & Hill, C. (1980). Prelanguage communication programming for the severely and profoundly handicapped. Journal of the Association for Persons with Severe Handicaps, 5, 224-234.

Sternberg, L. (1982). Communication instruction. In, L. Sternberg and G. Adams (Eds.), Educating severely and profoundly handicapped students, pp. 209-243. Rockville, MD: Aspen Systems.

Sternberg, L., Pegnatore, L., & Hill, C. (1983). Establishing interactive communication behaviors with profoundly mentally handicapped students. Journal of the Association for Persons with Severe Handicaps, 8, 39-47.

HOW TO GIVE A LISTENING CHECK TO A HEARING AID

1. Insert a new battery, matching positive and negative terminals. If necessary, clean battery terminals and contacts.

2. Set controls:
    (a) "on/off" switch in "off" position
    (b) Volume control at lowest setting
    (c) Switch in "M" (mike) or "MT" (mike-tel.) position
    (d) Tone control on setting most frequently used

3. Place receiver to your ear. Cover the receiver with the palm of your hand. Hold the hearing aid away from your ear to prevent feedback.

4. Turn the hearing aid on. Turn the volume control wheel up and down slowly, listening for scratchiness or dead spots. The volume control should neither be excessively loose, nor bind against the case. Check for distortion.

5. Turn the "on/off" switch back and forth to check for intermittent or loose contacts.

6. Change to the other tone positions and listen for appropriate changes in pitch or quality of the sound.

7. Roll the cord back and forth between the fingers to check for "cut-outs."

8. Check the firmness of cord connections. Have spare cord available.

9. Check ear molds for wax.

10. Gently tap the hearing aid on all sides to check for a reduction of power or loose connections. Check for loose screws in the case.

11. With the aid in the "off" position and the receiver out of your ear, place your thumb firmly over the opening in the receiver. Turn the hearing aid on and turn the volume all the way up. Listen for a soft whistling sound from the hearing aid case or from the receiver. The aid should be serviced if whistling or feedback is internal.

12. Clean the earmold and attach it to the receiver. Place your thumb firmly over the hole in the earmold and turn the hearing aid to its loudest position. If you hear a faint whistling at the receiver, be sure there is a thin plastic washer between the receiver and earmold or the "receiver-saver" is in position. Recheck the aid. Certain types of hearing aids have a washer between the cord and receiver. Your dealer will advise you if one is needed. If the whistling persists, return the hearing aid to your dealer for service.

13. If possible, have an earmold made for yourself to aid in listening to and checking each child's hearing aid.

Adapted from: *Caring for a Child's Hearing Aid*, Charlotte Dempsey, Audiological Services, Zenith Hearing Aid Sales Corporation

Reprinted from:
Kukla, D., & Connolly, T.T. *Assessment of auditory functioning of deaf-blind/multihandicapped children*. Dallas: South Central Regional Center for Services to Deaf-Blind Children, 1978.

CALIBRATED TOYS

The following toys have been calibrated with a sound level meter according to intensity—that is, the loudness level of each toy has been measured. They have been calibrated at 6", 1', 2', 3', and 6'. The lower the decibel (dB) level, the softer the sound the toy produces. The higher decibel levels indicate louder sounds.

These calibrations (measurements) are not exact. The loudness of the sound produced depends on the person activating the toy (e.g., how hard she shakes toy), the surface upon which it is activated (e.g., table, rug, tile), and the background noises in the room itself. We have attempted to keep these variables as consistent as possible in calibrating the toys. The teacher should likewise present the toys in the same manner if she wishes the loudness level to remain constant.

The toys have been divided into ranges of 10 decibels and are listed within each range in approximate order of increasing intensity. It is recommended that the teacher calibrate other toys in her classroom, environmental sounds around the classroom, and her voice and add them to the following lists. A sound level meter is usually available from an audiologist for these calibrations. All toys have been calibrated on a 1½" thick tabletop in a soundproof room unless otherwise indicated. Toys with an asterisk (*) are included in the Auditory Assessment Kit and are available on loan from the South Central Regional Center for Services to Deaf-Blind Children.

LESS THAN 50 dB

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
* Baby Action Ball (yellow hourglass ball)	Playskool	turn over and let pieces fall through	6", 1', 2'
* Music Box Owl	Fisher Price	wind up to play music ("Cradle Song")	6'
* "Rattle Pals" — blue whale, red snail, yellow fish rattles	Child Guidance First Play	shake back & forth hard	3'
small red hopping frog	Japan	fully wound, let hop on table	6'

50 - 60 dB

	TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
*	Rattle Pals – plastic whale, snail, fish	Child Guidance First Play	shake back and forth hard	6", 1', 2'
*	Music Box Owl	Fisher Price	wind up and let play	6", 1', 2', 3'
*	Clear Casta (red & blue plastic)	Japan	pinch together *softly*	2', 3'
*	Wooden tube knocker with stick	Taiwan	hit softly	2'
*	Flower rattle	Fisher Price	shake side to side 4x/sec.	2', 3'
	Wooden windup truck	Mattel	fully wound, hold by tower and let wheels spin	6'
	Happy Hoppers	Fisher Price	roll back & forth (12") by handle on floor (rug)	6'

60 - 70 dB

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
* Flower Rattle	Fisher Price	shake side to side 4x/sec.	6"
* Clear Casta	Japan	(1) pinch together hard (2) pinch together soft	6' 6", 1'
Bells		shake soft	2'
Kittie in the Keg (nesting barrels)	Child Guidance	put small light green barrel in large dark green barrel – turn from side to side, 2x/sec.	6", 1', 2', 3'
* Rubber Jacks ball		release from 6" into 1-lb. metal coffee can	2', 3'
Roly Poly Chime Ball	Fisher Price	roll back & forth on table	6", 1', 2', 3'
* Happy Apple	Fisher Price	roll back & forth on table	6", 1', 2', 3'
Whistling Ride-it Loco	Marx	press the yellow toot horn soft-medium	3', 6'
Yellow plastic squeeze porcupine	Space Lanco	squeeze hard	3', 6'
Pound-a-Round	Child Guidance	push down top and release	3', 6'
Shape-o-Ball	Tupperware	drop piece in	3'

Cont'd

60 - 70 dB (Continued)

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
Queen Buzzy Bee	Fisher Price	roll back and forth on floor (rug) within 12", holding it with your hand	6'
Halloween round tin cat rattle		shake 4x/sec.	6'
* Wooden clacker	Creative Playthings	bang together 2x/sec.	6'
Busy Box	Kohner	push button	6", 1', 2', 3'
Jalopy	Fisher Price	roll back and forth within 2", holding car at center	6'
small red windup hopping frog	Japan	fully wound, let hop on table	2', 3'
wooden windup truck	Mattel	fully wound, hold by tower in center of car and let wheels spin	2', 3'
Raggedy Ann plastic rattle	Bobbs-Merrill	shake back & forth 4x/sec.	3', 6'

70 - 80 dB

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
Shape-o-Ball	Tupperware	drop piece in, one	6", 1', 2'
Raggedy Ann plastic rattle	Bobbs-Merrill	shake back and forth	6", 1'
Halloween noisemaker		swing around	6'
Hopping Frog windup 1½"	Japan	fully wound, put on table	6", 1'
Ping Pong ball in can		release into 1-lb. metal coffee can from 6"	2', 3'
Tennis ball in can		release into 1-lb. metal coffee can from 6"	1', 2', 3'
* Jacks ball in can		release into 1-lb. metal coffee can from 6"	6", 1'
* Wooden clacker	Creative Playthings	shake 2x/sec.	6", 1', 2'
* Clear Casta (plastic red & blue)	Japan	clack hard	2', 3'
* Chatter Telephone	Fisher Price	turn dial release roll back & forth on table	6", 1', 2', 3' 3' 6", 1', 2', 3'
Porcupine Squeeze Toy	Space Lanco	squeeze head	6", 1', 2'
Busy Box	Kohner	– up on table, turn dial on clock – move car back & forth	6", 1', 2' 2', 3'

Cont'd

70 - 80 dB (Continued)

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
Cymbals		bang together very softly	2'
Bells (3 on a band) Tambourine		shake hard shake hard	2' 2'
* plastic maraca		shake softly	2'
* tin horn		blow softly	2'
Jack-in-the-Box	Fisher Price	push button for voice	1', 2', 3'
Halloween noisemaker, tin rattle		shake 4x/sec.	1', 2', 3'
Jalopy	Fisher Price	roll back & forth within 12" holding car at center	2', 3'
Pop corn Top	Child Guidance	push down top & release	3'
Pull-a-Tune	Fisher Price	roll back & forth within 12"	6", 1', 2', 3'
Ride It Loco	Marx	press the yellow toot horn hard	3', 6'
Queen Buzzy Bee	Fisher Price	roll back & forth on table with hand within 12"	2', 3'
* Wooden Knocker		hit hard with stick	2'

80 - 90 dB

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
Queen Buzzy Bee	Fisher Price	roll back & forth on table within 12"	6", 1'
Jack-in-the-Box	Fisher Price	push button for voice	6"
Halloween noisemaker tin rattle		shake 4x/sec.	6"
* Clear Casta, red, blue	Japan	pinch together hard	6", 1"
Busy Box	Kohner	turn clock dial push car telephone dial	2', 3' 6", 1' 6", 1', 2', 3'
Popcorn Top	Child Guidance	push down top & release	6", 1', 2'
* Chatter Telephone	Fisher Price	release dial	6", 1', 2'
Jalopy	Fisher Price	roll back & forth within 12" holding car at center	6", 1'
* Plastic maraca		shake hard	2'
* Shake and Sort	Child Guidance	turn over and let fall shake hard, beads fall from big holes on top, shake down	2', 3'
* 1" wooden cubes in coffee can		release from 6" above into 1-lb. metal can	6", 1', 2', 3'
Ping pong ball in coffee can		release from 6" above into 1-lb. metal can	6", 1'

Cont'd

80 - 90 dB (Continued)

TOY	MANUFACTURER	DIRECTIONS	DISTANCE FROM CHILD
Tennis ball in coffee can		release from 6" above into 1-lb. metal can	6"
• Tin horn		blow hard	2'
Halloween noisemaker tin swinging handle		swing around	6", 1', 2', 3'
Postal Station	Play Skool	drop cube or cylinder into empty box	3'

MORE THAN 90 dB

• Shake & Sort	Child Guidance	– turn over and let fall, big holes on top then turn over until all colors separated – shake hard to get beads from big holes on top, turn to shake down, all together	6", 1'
Postal Station	Playskool	drop cube or cylinder into empty box	6", 1', 2'
Cymbals		bang together hard	2'

Reprinted from:
Kukla, D., & Connolly, T.T. *Assessment of auditory functioning of deaf-blind/multihandicapped children*. Dallas: South Central Regional Center for Services to Deaf-Blind Children, 1978.

OUTLINE: PRELINGUISTIC COMMUNICATION

Objectives: Faculty will be able to instruct teacher trainees in:

- recognizing communicative behaviors used by nonverbal children as precursors to formal language (oral, sign, augmented systems)

- utilizing appropriate cuing systems for nonverbal children (receptive comprehension)

- utilizing routines and interactions to develop the child's communication to others (expressive intents)

- designing appropriate IEP goals and classroom activities to develop communication in nonverbal children

I. Language v. Communication

A. Definitions

Communication: acquired in social situations for social goals to express cognitive content

Input : Visual (gestures, facial, situational cues)
Auditory (words, intonation, inflection, "Motherese")
Other (tactual, vestibular)
Output: Oral (vocal, verbal)
Nonoral (gestures, signs, facial, other behaviors)

Language: symbolic, with 1-1 correspondence and rules/word order

examples: English, ASL, "communication" boards

Modality - Content - Function

B. Communicative Functions (Stremel-Campbell handout and article in TR review, Donnellen article)

protest
request (food, stimulation, action, objects)

- greet, social acknowledgement
- call, request attention
- request permission
- offer
- comment, label
- reply, answer
- question
- provide new information

C. Acquisition of Form : Communication and formal language(Stremel-Campbell handout, Reichle article, Siegel-Causey/Guess in TR review)

- refelxive behaviors
- purposeful behaviors
- primitive intentional communication
- conventional intentional communication
- emerging concrete language
- emerging symbolic language
- referential symbolic language
- decontextual symbolic language
- prelanguage-language relations
- two-word relationships

D. Communicative behaviors: Modality (TR videotape, Donnellen article)

- general body movement
- specific body movement
- push away
- manipulate person
- extend object
- eye contact
- touch/tap person
- conventional gestures
- combinations
- aberrant behaviors

II. Receptive Comprehension

A. Tactual cues (Stremel-Campbell)

B. Gestural cues (Tawney et al)

C. Object or class cues (Silverrain and Rudin articles)

D. Signing (iconic signs/gestures v. ASL)

E. Other

III. Expressive Communication

A. Importance of the communicative functions

- Motivation -Meaning-Modality

B. Principles and Strategies (Stremel-Campbell and Siegel-Causey/Guess in TR review)

- Nothing Is Free - providing opportunities (v. learned helplessness)
- Pause And Effect - turntaking and dyadic interactions
- Assume Meaning - responding to the child, expanding to the next level
- Protogestures (want, eat, drink, finish,more)

C. Special approaches for nonresponsive children (Silverrain article, chapters on Van DijK, Siegel-Causey/Guess in TR review)

IV. Instructional Issues (TR review)

A. Sequences (Reichle article)
- Oregon Department of Education (Otos)
- Teaching Research (Stremel-Campbell)

B. Classroom Organization

- ICS programming (Kansas)

C. Implications of sensory loss on communication: Summary
- HI: intonation and inflection cues
  repetition
  experiential/conceptual base
- VH: gestural and facial cues
  experiential/conceptual base

Handout I-C

Communication-Functions/Intents of Students with Handicaps

Functions	Examples of		
	Prelanguage		Language Behavior
Protest	Push away, shake head		Signs, "no," "stop"
Request food	Extend cup	Gesture eat	"Bite"
Request stimulation action	Manipulates adult	Gesture "hug"	Signs, "more"
Request nonfood actions/objects	Gives toy to be wound up	Points	Signs, "music"
Greetings/Social	Waves "hi"		Says, "Bye"
Calling-Requesting Attention to self	Taps adult		Says, "Mama"
Requesting permission	Grabs waistband	Points	Signs, "bathroom"
Offer	Transfer object to person		Says, "here" (bus is here)
Comment, Label	Points, shows gestures "mine"		Says, "look" Signs, "bus"
Reply		Smiles	Says, "Okay"
Answer	Responds to question by pointing, shaking head		Answers, "there" when asked, "Where's your coat?"
Questions	Vocalizes with rising intonation Hunches shoulders		Signs, "Where?"
Provides new Information			

Based on Dore, 1975
SNN115

"Kathleen Stremel-Campbell, 1985"

LEVELS OF COMMUNICATION DEVELOPMENT : FUNCTIONING

(adapted from Kathleen Stremel-Campbell, Handout I-A, 1985)

Reflexive Behaviors

Behaviors are not purposeful or intentional, but persons interpret these behaviors to reflect the child's state (hungry, wet, hurt, distressed)

Intentional Behaviors (Purposeful Behaviors)

Behaviors are purposeful but not intended to communicate. The child may reach out to grasp an object or move body to reinstate an action.

Primitive Intentional Behaviors

Behaviors are simple nonlinguistic (non-language) means of communication to signal intents to another person. Behaviors are directed at the person OR at the object, not both.

Conventional Intentional Communication

Behaviors are complex coordinations of expressing communication intent through objects/event AND other persons. They are characterized by gestures and/or intonation patterns.

Emerging Concrete Language

Behaviors consist of concrete object representations, protowords, or protosigns, used for communicating functions or intents.

Emerging Symbolic Language

Behaviors are "adult" forms, but a specific form is used to communicate only one function (request, protest, label). Vocabulary is limited.

Referential Symbolic Language

Behaviors are true symbols "referring" on a 1:1 correspondence to the object, action, event, feature. However, the referents are visible and part of familiar routines. Forms stand for more than one function.

Decontextual Symbolic Language

Behaviors are referential symbols that can be used out of a familiar routine when the object or event is not readily visible.

Prelanguage-Language Relations

Prelanguage and language behaviors are combined to mean more than one thing. Adult can interpret two meanings ("Mama" _look_; _No_ "water")

Two-word Relationships (Semantics)

Two symbols are combined to express different meanings based on the environmental context and the gestures, intonation and expression of the student.

JASH
1985, Vol. 10, No. 3, 146–156

copyright 1985 by
The Association for Persons with Severe Handicaps

The Selection of an Augmentative System in Communication Intervention: A Critique of Decision Rules

Joe Reichle
University of Minnesota

George Karlan
Purdue University

Sets of augmentative decision rules used to determine a learner's candidacy for an augmentative communication system were reviewed and critiqued. Particular scrutiny was given to criteria addressing certain cognitive acquisitions and the identification of a significant communication deficit(s) as prerequisites to system implementation. A case is presented to support the use of an augmentative communication system as a preventive treatment and a potential facilitator of language comprehension skills. An alternative approach to traditional decision rules that involves the implementation of procedures that allow the simultaneous scrutiny of graphic (communication board), gestural (sign), and vocal communicative modes is proposed.

Within the past few years, several sets of decision rules have been posited that address the selection of augmentative communication systems (Chapman & Miller, 1980; Nietupski & Hamre-Nietupski, 1979; Owens & House, 1984; Sailor et al., 1980; Scheuerman, Baumgart, Simpsa, & Brown, 1976; Shane, 1980; Shane & Bashir, 1980). Most of these investigators have favored (if not advocated) the use of a two-tiered process in which the need for an augmentative system is quantified first, and, subsequently, a specific system is chosen. An alternative suggestion is to sample two augmentative modes with a learner before selecting a single augmentative system (Alpert, 1980; Kiernan, 1981). More recently, Keogh and Reichle (1985) have suggested that forcing a quick selection between signing and communication boards may create a "pseudo-issue" for the interventionist. Many learners may benefit from continued use of a "mixed" system: that is, one that combines the use of some signs/gestures with other graphic symbols. Consequently, selecting a single augmentative system, although important, may not be the *most critical initial issue.*

The intent of this article is to analyze available decision rules. Particular attention will be placed on the validity of these rules in light of recent literature addressing the necessity of certain cognitive prerequisites and best practices in the establishment of an initial repertoire of communicative behavior. Finally, we will consider the role that the decision rules reviewed might have on efforts to prevent the deteriorization of communicative skills.

Describing Existing Decision Rules

Four basic sets of decision rules for determining whether to implement a nonspeech communication system have been reported (Chapman & Miller, 1980; Nietupski & Hamre-Nietupski, 1979; Sailor et al., 1980; Scheuerman et al., 1976; Shane, 1980; Shane & Bashir, 1980). These decision rule sets are not exclusive of one another and often overlap. Their commonalities and differences can best be understood by examining factors that each set of rules uses in assisting teachers and speech pathologists to make decisions regarding the implementation of augmentative communication systems.

Three questions appear to guide the formation of decision rules under review:

1. When should nonspeech communication programs be initiated (Nietupski & Hamre-Nietupski, 1979)? Or alternatively, who is a good candidate for nonspeech communication systems (Chapman & Miller, 1980; Sailor et al., 1980; Shane & Bashir, 1980)?
2. Should the nonspeech system augment or substitute for spoken communication (Alberto, Garrett, Briggs, & Umberger, 1983; Chapman & Miller, 1980)?
3. Which nonspeech system is best suited for the individual (Chapman & Miller, 1980; Nietupski & Hamre-Nietupski, 1979)?

Preparation of portions of this article was supported in part by Contract 300-82-0363 awarded to the University of Minnesota from the Division of Innovation and Development, Special Education Programs, U.S. Department of Education. The opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education and no official endorsement should be inferred.

Requests for reprints should be sent to Joe Reichle, Department of Communication Disorders, 115 Shevlin Hall, 164 Pillsbury Drive S.E., University of Minnesota, Minneapolis, MN 55455.

Table 1

Characteristics Considered for Use and Used in Decision Rules for Determining Whether to Implement a Nonspeech Communication System with an Individual

	Age	Status of speech production mechanism	Etiology of language production problem	Past performance in speech production training	Degree of language development		Level of cognitive development	Degree of pragmatic development	Evidence of emotional problems	Level of environmental support
					Comprehension	Production				
Scheuerman et al. (1976) Nietupski & Hamre-Nietupski (1979)	Decision point	Considered		Decision point	Considered	Decision point				
Chapman & Miller (1980)	Considered	Considered		Considered	Decision point	Decision point	Decision point	Decision point		
Shane (1980)	Used	Decision point	Used	Decision point	Used	Decision point	Decision point	Used[a]	Used	Decision point
Shane & Bashir (1980)										
Sailor et al. (1980)		Considered		Considered	Considered	Considered	Decision point	Considered		Considered

[a] Though not considered explicitly, some aspects of this characteristic are included in the evaluation of language production capability.

The only question held in common by the decision-rule systems under review is the question of candidacy. Thus, the only outcome common among them is deciding the appropriateness of the use of nonspeech communication systems with an individual.

In the following discussion of the candidacy decision rules, Tables 1 and 2 will be referred to extensively. Table 1 lists, for each rule system being examined, characteristics of the individual, training history, or environmental variables that are included in the decision system. In some cases, the decision systems *consider* certain factors either implicitly or explicitly, but *do not* actually use them as a basis for a question or decision point. At the next level, factors are used as a basis for questions, and, hence, information gathering, but that information has no differential effect on decision outcome. At the final level the factors or characteristics are used as the basis for decision points. These decision points produce differential effects on outcome. In those systems where actual decision points can be stated, Table 2 contains the actual decision rule system or set of questions.

Scheuerman et al. (1976), later published by Nietupski and Hamre-Nietupski (1979), consider and use (see Tables 1 and 2) the fewest decision points of any of the four decision rule sets. Although considered, the degree of language comprehension is not a specific criterion for augmentative system selection. In this system, comprehension and production may be at equal levels in development, or a discrepancy may exist between them. The status of the speech production mechanism (the ability to produce and control speech sounds) is considered, but its importance in determining appropriate use of nonspeech systems appears to be subsumed under the consideration of training history; an inability to produce and control speech sounds undoubtedly would contribute greatly to the failure of past efforts at training speech production. Additionally, the inability to learn verbal imitation even when an intact speech production mechanism exists will result in failure to acquire speech production. Thus, examination of the results of speech production training would appear to be more informative and therefore a better decision point than just the current status of speech production. The *obvious drawback* is that considerable time (5–8 years according to the rule) must be invested in trial speech production training. Furthermore, this rule presumes that intervention efforts implemented during the learner's first 5–8 years represented systematically implemented logical procedures.

Chapman and Miller (1980) presume that successful acquisition of language, whether spoken or nonspoken, is predicated upon the development of a certain level of cognitive performance and that there must be a language production problem before nonspeech intervention is appropriate. Thus, they do agree that the failure to develop productive speech commensurate

Table 2

Rules Systems for Deciding an Individual's Candidacy for Augmentative Communication Systems Use

Scheuerman et al., 1976; Nietupski & Hamre-Nietupski, 1979

An individual is a candidate, if

1. there is not adequate language production ability; *and*
2. he or she is past the age (5–8 years) at which language production should have developed; *and*
3. speech production training programs have failed.

Chapman & Miller, 1980

An individual is a candidate only if

1. there are no intelligible single-word utterances; *and*
2. cognitive development is at least at Piagetian Sensorimotor Stage 6; *and*
3. the individual is producing performative behavior (demonstrating communicative intention); *and*
4. (a) the individual has a deviant speech production mechanism, *or*
   (b) there is cognitive development at the early preoperational stage of cognitive development, or cognitive development ≥ comprehension > production ≤ communication function.

Shane, 1980; Shane & Bashir, 1980

Path 1

1. (a) cognitive development is at least at Sensorimotor Stage 5 intelligence, *or*
   (b) a mental age of 18 months has been attained or there is a demonstrated ability to recognize photographs, *and*
2. there are persistent oral-reflex problems, *and*
3. the family is willing to implement nonspeech systems of communication.

Path 2

1. (a) cognitive development is at least at Sensorimotor Stage 5 intelligence, *or*
   (b) a mental age of 18 months has been attained or there is a demonstrated ability to recognize photographs, *and*
2. the individual has had trial therapy, *and*
3. the trial therapy was appropriate, *and*
4. the progress of the previous trial therapy was too slow to enable effective communication, *and*
5. the family is willing to implement nonspeech systems of communication.

Path 3

1. (a) cognitive development is at least at Sensorimotor Stage 5 intelligence, *or*
   (b) a mental age of 18 months has been attained or there is a demonstrated ability to recognize photographs, *and*
2. (a) the individual's speech is unintelligible except to family and friends, *or*
   (b) the individual's predominant mode of communication is through pointing, gesture, or facial-body affect, *or*
   (c) there is a predominance of single-word utterances, *or*
   (d) the individual exhibits frustration with the inability to speak, *and*
3. the individual has had no trial therapy, *and*
4. (a) the individual cannot accurately imitate speech sounds or words, *or*
   (b) the individual cannot accurately imitate gross motor or oral motor movements, *and*
5. the family is willing to implement nonspeech systems of communication.

with chronological age and failure of past speech production training to yield functional spoken communication are good reasons for intervention (see Table 1). However, in sharp contrast to the decision rules proposed by Scheuerman et al. (1976), Chapman and Miller (1980) argue that these are not sufficient reasons for instituting augmentative systems. The key to the decision rules (see Table 2) formulated by Chapman and Miller (1980) is the relationship between cognition, comprehension, and production. The inclusion of the alternate requirement of a deviant speech mechanism appears to be redundant with the requirements of unintelligible speech. (It does not matter why language production is unintelligible, only that it is.)

By far, the most complicated system of decision rules is that delineated by Shane (1980) and Shane and Bashir (1980). All nine of the factors found in Table 1 were considered and are apparently used at some level within the decision-making process. However, as indicated in Table 1, only five of these factors are used as specific decision points in deciding whether nonspeech communication is appropriate for an individual.

One factor common to each of the paths delineated by Shane (1980) and Shane and Bashir (1980) is the status of the learner's cognitive development. If cognitive development is at or beyond Sensorimotor Stage 5 intelligence, then the decision process can continue. The other common factor is the willingness of significant others in the environment to implement the nonspeech systems. Following the determination of cognitive status, the status of the speech production mechanism as evidenced by persistent oral-motor reflex problems is examined; if problems are found and the environment is cooperative, implementation is undertaken. If, however, no evidence is found, then past speech production training is evaluated (Path 2); if previously unsuccessful training is demonstrated and the learner's current environment is cooperative, implementation is undertaken. If, however, there has been no speech production training (Path 3), then the degree of speech or language production is examined along with the ability to imitate speech sounds, gross motor, or oral-motor movements. If deficiencies are identified and the environment is cooperative, then implementation is undertaken. All of the preceding paths apply to learners who have failed previously to emit verbal utterances.

Sailor et al. (1980) recommended a set of decision rules that address separately the identification of output as well as input modes for learners with severe oral/aural mode deficits. With respect to outputs, the interventionist must first answer four questions: (a) Can the learner benefit from incoming auditory information?; (b) Can the learner benefit from incoming visual stimuli?; (c) Will the learner's oral-motor status support speech output?; and (d) Is the learner vocally imitative? If the answer to these initial questions is "yes," a speech mode is selected. If, on the other hand, the answer is "no" (presumably to any of the questions), the interventionist is asked to complete a comparative evaluation of signing and boards based on environmental considerations (e.g., preference of parents, cost of system, and so forth) in addition to the proficiency with which the learner might be able to use the available response modalities. Learners who point are determined to be candidates for communication boards (blind children who point are candidates for tactile stimuli on communication boards).

Like Chapman and Miller (1980) and Shane (1980), Sailor et al. (1980) adhere to the cognitive prerequisite of imitation before consideration of an augmentative system. As was the case in the decision rules of Shane (1980), the failure to engage in generalized imitation serves as a criterion that allows the interventionist to opt for an augmentative system. Presumably, a learner would have to be enrolled in vocal imitation training for some (unspecified) amount of time without significant success before an augmentative mode would be implemented. Furthermore, Sailor et al. (1980) appear to direct an augmentative user to sign as a preferable system to boards; that is, their decision rules focus the user on boards as a last resort, yet no clear explanation for this direction is provided.

With respect to determining whether the use of nonspeech communication systems is appropriate for an individual, four sets of criteria (as shown in Table 1) can be discerned. No totally common approach to the issue of how the nonspeech systems should be used, whether in support of or in place of spoken communication, can be found. Nietupski and Hamre-Nietupski (1979) simply advocate concurrent training so that spoken communication is always augmented. Chapman and Miller (1980) make a clear distinction between augmentative usage and usage as a substitute for spoken communication. They indicate that, if there is clearly a deviant speech production mechanism, with a poor prognosis for improvement, then nonspeech communication systems will be required as a substitute for rather than an augmentation of speech. Shane and Bashir (1980) state that a decision to elect nonspeech systems "designates that such a system be used to facilitate oral language production . . . to augment communication . . . to enhance oral speech intelligibility . . . or some combination of the above" (p. 410).

One may, however, question how speech facilitation or enhancement results from the application of these decision rules. There is no option in the rules of Shane and Bashir (1980) permitting spoken language production to continue during the implementation of nonspeech communication. The actual outcome points would appear to indicate that the nonspeech systems substitute for the oral systems. Instead of focusing on global indices of intellectual development, Sailor et al. (1980) are interested in the learner's vocal imitation ability. Their decision rules seem to require that the subjects be able to learn to communicate intentionally regardless of their current status on the means-end cognitive domain. This lack of attention to means-end represents a significant distinction between rules posited by Sailor et al. (1980) and those described by Shane (1980) as well as Chapman and Miller (1980).

Despite their differences in criteria used to select a nonspeech system, the decision rules reviewed thus far have a common focus: determining *when* it is advisable to use a nonspeech system of communication. All four sets of decision rules adhere to the same basic strategy of first setting up a certain severity of impairment that must be present, and subsequently scrutinizing prerequisites required for entry into an augmentative system. As a result, a significant number of learners with severe disabilities become trapped in a "no man's land" of having a sufficiently severe impairment but failing to have the prerequisites necessary for an augmentative system (primarily cognitive).

In the discussion that follows, we will explore the difficulties in implementing augmentative decision rules. Furthermore, we will explore evidence addressing the utility of prerequisites for augmentative system implementation addressed in decision rules reviewed.

Can Existing Decision Rules be Implemented Systematically?

Individual variability in language acquisition, as well as procedural vagueness, would make it difficult to implement systematically the decision rules reviewed. All of the existing decision rules require the interventionist to identify a significant communication delay. Given the extreme variability in the communicative development even of normal preschoolers, it may be very difficult to identify the point at which a communicative delay becomes predictive of a significant problem. Variability extends across phonological, semantic, pragmatic, and syntactic skills as well as across comprehension and production. With a very young child, it is difficult to conclude whether failure to produce a spoken word by 18–19 months represents a significant delay when there is a reasonably good chance that the child in question will develop normal communication production. The identification of significant lags becomes even more difficult when the interventionist attempts to make relative comparisons between comprehension and production skills. This is true particularly in the case of the decision rules of Chapman and Miller (1980) which require that direct comparisons be made.

One final complication is inherent in the decision rules of Chapman and Miller (1980). In addition to comprehension-production comparisons, they require that the interventionist compare the learner's *current cognitive status* with *language comprehension and production*. Unfortunately, Chapman and Miller (1980) do not specify whether to use individual cognitive subscale data (i.e., means-end, causality, imitation, space, imitation [motor and vocal], object permanency) or to use some combinatory or "average" cognitive status which is more difficult and possibly more misleading to use with learners who have severe disabilities. Rogers (1977) documented the fact that a severely intellectually delayed population exhibited less homogeneity across cognitive subscales than normal children. For example, a child with severe handicaps might be operating at Sensorimotor Stage 3 (4–8 months) performance in motor imitation but Stage 5 (12–18 months) in means-end. Subsequent data continue to support the conclusion that individuals having severe handicaps are heterogeneous with respect to the level of cognitive development attained across several different areas of behavior at a given point in time (Karlan & Lloyd, 1985). Obviously, this heterogeneity, when manifest across cognitive assessment scales, casts considerable doubt on the precision of an overall cognitive stage score which both Shane and Bashir (1980) and Chapman and Miller (1980) seem to recommend.

In determining criteria for a significant communicative delay, existing decision rules seem to have oversimplified the considerations involved. These oversimplifications include primarily *interlearner* variability in the case of some communicative criteria, as well as *intralearner* variability in the case of cognitive skills.

Cognitive Acquisitions as Prerequisites to Augmentative System Use

Recently, Rice (1983) stated that, "there is a detectable sense of frustration regarding the elusiveness of cognition and its role in language impairment and the remediation process" (p. 347). At present, there are no empirical data that support a causal relationship between cognitive and communicative behavior in either normal or intellectually delayed learners. That certain cognitive and language skills appear to develop in fairly close temporal proximity may be dependent upon some underlying source common to both domains of development such as the more fundamental Piagetian processes of assimilation and accommodation or the developments in cognition and language may be interactive (there may exist a bidirectional influence).

Setting aside the theoretical issues, one might ask whether the empirical evidence supports the targeting of any particular cognitive skill or skills which would facilitate acquisition or use of specific communication skills or functions. Any proposed causal relationships between cognitive development and communication acquisition require a more careful examination.

Imitation

Most language intervention programs rely exclusively on the vocal modality to teach production skills. Approximation of spoken words can be taught by relying on response-shaping or response-prompting strategies. Response shaping is a tedious and time-consuming procedure because the learner must "discover" the correct sound topography based only upon the teacher's feedback. Although some sounds require movements of articulators outside the mouth (e.g., lip closure for "m," lip rounding for "o"), which can be physically guided by molding the learner's lips into the proper shape, it is generally accepted that learners who are able to imitate proceed much more quickly in sound/word production programs than those who are not. Consequently, vocal imitation has come to be considered a prerequisite for language production in most of the commonly used language intervention procedures (Guess, Sailor, & Baer, 1978; Kent, 1974; Lovaas, Berberich, Perloff, & Schaeffer, 1966).

The prerequisite status of *vocal* imitation quickly spread to include motor imitation as a prerequisite for producing communicative behavior in the gestural mode. Although imitation may be the most straightforward method of acquiring new topographies of communication, response shaping may be developed independent of an imitative repertoire. Often children are observed to fuss or vocalize loudly when they desire a particular object/event. Based upon a shaping paradigm, it should be possible to teach the child to use a more socially acceptable vocalization to request or to reject in the absence of being under the control of modeled behavior. However, few curricula recommend this approach and instead dwell on the establishment of an imitative repertoire.

Many curricula sought to teach motor imitation skills in the hope that the motor imitative repertoires would generalize to the vocal mode. The logic for this hope seemed somewhat compelling. If imitation is a cognitive class of behavior, it should not matter whether that class is taught through the use of motor or vocal exemplars. Motor imitation represents a desirable intervention target because it can be taught by using faded physical guidance.

Teaching a prospective vocal mode user to motor imitate will be helpful only if the learner generalizes to vocal repertoires. Garcia, Baer, and Firestone (1971) demonstrated that generalization across different topographies of responses should not be expected with learners who have severe disabilities. On the other hand, some interventionists have reported success in teaching generalized motor imitation first, and, subsequently, repertoires of vocal imitation. At present, there are no empirical data to suggest that motor imitation is a prerequisite for vocal imitation training. Nor is there any evidence to suggest that motor imitation is a prerequisite for beginning signing or communication board training. It is clear that if a learner engages in generalized imitation, a model (which is less intrusive than the delivery of a physical prompt) can be used to teach new communicative behavior. However, in the absence of competing data to demonstrate the necessity of imitation as a communication prerequisite, it seems illogical to require an imitative repertoire prior to the implementation of an augmentative communication system.

MeansEnd

Means-end performance refers to how individuals obtain objects, actions, or attention. The term is used to describe the coordination of means or intermediate behaviors necessary to achieve an end goal. In the earliest forms of this behavior, the intermediate behaviors must be an inherent part of the ongoing action sequence (e.g., looking at a desired object, reaching for objects). Later in a normal child's development, means-end procedures become more sophisticated in that the child will develop a procedure that forces him to divert his attention from the end (e.g., moving to another part of a room in order to fetch a chair in order to get cookies from a counter).

Communicatively, for example, around 1 year of age, the child begins to attract an adult's attention, to point, and usually to vocalize in an effort to procure a desired object. Chapman and Miller (1980) and Shane (1980) have proposed that learners be able to use "adults as agents" *prior* to language intervention. The rationale for these decision rules seems to be anchored in normative studies which have shown that the ability to use means that are independent of the end goal appears to be strongly correlated with prelinguistic, protoimperative communicative acts as well as initial single-word utterances in normal developing children (Bates, Benigni, Bretheton, Camioni, & Volterra, 1979).

The relevance of means-end to the acquisition of intentional communicative behavior seems to lie in the conditions necessary for learners to exercise intentional control over persons in their environment. It is reasonable to assume, as Rice (1983) has offered, that "The communicative behaviors of very young children can be regarded as *interactive* in nature, instead of being driven solely by a child's cognitive accomplishments" (p. 348). If this is true, it should be possible to establish communicative behavior through the use of response shaping that occurs as a result of successive interactions between the child and the caregiver (without specifying a particular level of means-end as a prerequisite).

Although imitation and means-ends are the cognitive classes referred to specifically in several of the decision rules reviewed, Chapman and Miller (1980) additionally refer to other cognitive classes.

Causality

Causality refers to the relationship between a learner's response and the consequence that it produced. Cause and effect relationships appear to relate to the establishment of the relationships between certain antecedents (discriminative stimuli) and their consequences, which most experts agree is an important aspect of language.

Traditionally, interventionists have attempted to link causality with both language comprehension and production. Chapman (1978) suggested that reports of children's understanding of communicative social acts are not usually reported until intentionality has been observed. Opportunities for learners to participate in social actions occur in a number of simple games that most parents play with their children. Generally, participation in these games begins with an undifferentiated but contingent response on the part of the learner. Next, the child begins to anticipate the action of the adult. Finally, the learner begins self-initiating the game.

As soon as the learner anticipates a portion of the game, he or she has demonstrated *situational understanding*. Situational understanding occurs when a learner's behavior is under stimulus control of gestural, prosodic, vocal, or other situational cues besides language.

There is limited empirical support demonstrating a significant relationship between the emergence of cause-effect relationships and language comprehension and production. For example, the attainment of Sensorimotor Stage 5 cognitive development in the area of operational causality has been reported by Harding and Golinkoff (1979) to be correlated with the use of communicatively intentional vocalizations by infants to affect the attention or action of an adult. On the other hand, it is apparent from the literature available that cause-effect relationships can be taught.

Object Permanency

Perhaps the best way to characterize object permanency is to say that when a child has this construct, he or she realizes that "out of sight does not mean out of mind." Attaining knowledge of object permanency allows infants to free themselves from the perceived environment to consider events that are not visible or immediately present. Descriptions of the development of object permanency have focused around the child's acquisition of visual pursuit and searching skills.

For some time, interventionists have assumed that object permanency was critical in the acquisition of both language comprehension and language production (Bricker & Bricker, 1974; Kent, 1974; Owens & House, 1984). Other investigators such as Bloom (1970) had noted that children did not appear to talk about things other than those immediately present until they were nearing mastery of object permanency. In fact, Bloom (1970) expressed the belief that mastery of object permanency was a critical factor in children's acquisition of relational semantic skills (e.g., recurrence and nonexistence).

A number of investigators (Bates, Benigni, Bretheton, Camioni, & Volterra, 1976; Bates et al., 1979; Corrigan, 1976; Ingram, 1974; Miller, Chapman, Branston, & Reichle, 1980) have searched for an empirical link between language acquisition and object permanency and have failed to find significant relationships between object permanency and language acquisition after chronological age had been partialed out. Other investigators (Moore, Clark, Mail, Rajotte, & Stoel-Gammon, 1977), however, found a significant correlation between object permanency and language acquisition independent of chronological age in their scrutiny of 11 infants between 3.8 and 5.3 years old with Down syndrome.

The assessment of object permanency among learners with severe handicaps has received a great deal of attention (Illmer, Rynders, Sinclair, & Helfrich, 1981; Kahn, 1975). Illmer et al. (1981) found that motor abilities significantly affect children's performance in object permanency tasks. Kahn (1975) attempted to teach object permanency skills to a group of learners with severe disabilities. He reported advances between treatment and control groups. However, since he did not control for reinforcer preference, it is difficult to say whether object permanency or object preference was stimulated.

At present, the relationship between the object permanency and language acquisition has yet to be resolved satisfactorily. It is also unclear exactly how successful object permanency can be stimulated. It seems reasonably clear that reinforcer preferences and motor skills (particularly reaching) can influence measures of object permanency.

Other Cognitive Factors

Other specifications of cognitive prerequisites in augmentative decision rules have been much more general. For example, Shane and Bashir (1980) suggested that learners functioning at a level commensurate with a normal 12-month old are "probably not at an appropriate age for a communication prosthesis, even one made out of the most iconic materials" (p. 414). To the contrary, Reichle and Yoder (in press) demonstrated that simple labeling skills could be taught before a child was functioning as a 12-month old. In the signing modality, McIntire (1974) described the use of signed vocabulary by an 8-month-old hearing-impaired child. Assuming that this child was intellectually normal, it would appear that signing as an augmentative modality can be acquired in advance of 12 months of age. Stillman, Aylmer, and Vandivort (1983) have reported teaching individuals labeled severely and profoundly handicapped to use communicative "signals" to control participation in certain gross motor activities. These individuals were taught to use abbreviated forms of the action, idiosyncratic gestures, or actual manual signs to initiate an activity, request recurrence of an activity, redirect to another activity, and terminate activities. Even though these gestures were not specifically directed to an audience, they were under the control of other aspects of the environment. Thus, although they did not recognize the role of the audience and, therefore, would not be considered to have *intentional* communication, they did demonstrate an ability to learn a contextually relevant action (the signals) to control some aspect of the activity (the goal). The key issue is whether *social agency* (recognition of the need to direct messages to an audience) must be present before communicative behaviors can be taught. Intentionality as used here would require late Stage 5 to early Stage 6 cognitive development. The earlier unintentional (perlocutionary) communicative behavior demonstrated by students of Stillman et al. (1983) is still functional when compared with *intentional* behavior; however, it does require more attentive adults in the environment.

There seems to be a lack of convincing evidence to demonstrate a causal link between particular cognitive prerequisites and the acquisition of communicative behavior. However, there does seem to be a fairly compelling logic to suggest that some classes of behavior may facilitate the acquisition of communicative behavior. On the other hand, several negative reactions to a strong emphasis on cognitive skills can be stated: (a) cognitive skills have been treated as prerequisite skills, thereby "pigeon-holing" the learner into a level of intervention that might not have been necessary; and (b) there is lack of attention to the age-appropriateness of the intervention activity and/or the integration of the activity into the context of lifelong skills to be acquired. We are not suggesting that there are no cognitive prerequisites to the implementation of a communication system. However, it appears that the specificity with which authors of augmentative decision rules specify cognitive prerequisites is not warranted based on available empirical data.

Use of Augmentative Systems for Primary Versus Tertiary Prevention

One interesting by-product from the implementation of signing and communication board programs has been the apparent facilitating effect of augmentative systems upon acquisition of communicative behavior in the vocal modality. In the signing modality. Reichle. McQuarter, and Rogers (1983) reviewed numerous investigations that reported a positive effect of signing upon frequency and/or quality of vocal/verbal production. However, in most instances, the effects reported were anecdotal.

Remington and Clark (1983) demonstrated that the acquisition of both sign and vocal mode production as a product of a program of simultaneous speech and sign input occurred with a learner who was capable of vocal imitation skills. Conversely, vocal mode acquisition did not occur for a learner who did not engage in vocal imitation. This finding suggests that learners may be capable of attending to and benefiting from the presentation of two elements of a complex stimulus (sign and a spoken word): that is, they may be able to act differentially on each element. It does not necessarily suggest that signing was facilitative of the vocal mode.

In general, the conclusion of many investigations (Daniloff, Noll, Fristoe, & Lloyd, 1982; Konstantaneas, Oxman, & Webster, 1978) has been that signing in numerous instances facilitates the production of vocal/verbal repertoires and that exposing or teaching learners to sign has no adverse effect upon the acquisition of vocal mode communication. Of course, the opposing argument is that children might prefer sign, thereby discontinuing use of the vocal modality. The conclusion drawn here is that in the realm of production, augmentative systems may be a useful preventive measure to avoid later production deficits. Unfortunately, this potential benefit is minimized by decision rules which require a significant production delay prior to augmentative implementation. All four sets of decision rules described require significant evidence of delay prior to augmentative implementation. Decision rules offered by Nietupski and Hamre-Nietupski (1979) and Scheuerman et al. (1976) present the greatest problems in implementing a strategy using augmentative systems to reduce the probability of later production deficits, by waiting until the learner is between 5 and 8 years old before the decision to implement an augmentative system can be made.

In addition to the cross-modal facilitation issues, augmentative communication systems may represent a viable avenue for the facilitation of comprehension as well as production. Chapman and Miller (1980) suggested that one selection criterion has been met when the learner's production significantly lags behind the comprehension skills. This criterion implies that augmentative systems are intended primarily to deal with production deficits. If one were to pursue this logic, an individual with severe retardation might never be a candidate for an augmentative system if the child's comprehension was sufficiently delayed so that a comprehension/production gap never developed.

Several investigations demonstrate the effect of gestures upon the establishment of language comprehension skills among learners with disabilities. Baer, Peterson, and Sherman (1967) demonstrated that pairing an imitative model with a physical prompt and then systematically fading the use of that physical prompt served to transfer stimulus control from the physical prompt to the imitative model. Others, including Striefel and Wetherby (1974) and Striefel, Wetherby, and Karlan (1976), have demonstrated the effectiveness of an instruction-following paradigm in which a verbal instruction (which did not originally control learner performance) was systematically paired with a physical prompt. Over successive correct trials, the physical prompt was faded until the verbal instruction served to control the learner's motor response. The technology cited above is very applicable to the utilization of signs to facilitate the comprehension of verbal instructions, assuming that a "sign" is substituted or paired with the verbal instruction.

Several studies have demonstrated a direct facilitative effect of the use of manual signs upon comprehesion skills exhibited by learners with moderate and severe handicaps. Kohl, Karlan, and Heal (1979) demonstrated that the acquisition of instruction-following by children labeled severely handicapped was significantly better when spoken and manually signed instructions were combined as compared with the use of spoken instructions only. Additionally, Karlan and Lloyd (1983) found that comprehension recall, that is, identifying the correct picture from an array of pictures, was significantly improved by the use of manually signed cues during the learning task.

It seems very apparent that a rationale for the value of augmentative systems in the generation of vocabulary comprehension programs can be built and that this rationale will find sufficient empirical support to justify its application. Apart from any value in facilitating production, the use of augmentative techniques can benefit comprehension intervention.

Alternatives to Traditional Decision Rules

The majority of decision rules support the two-tiered process of first identifying a deficit and then examining which specific augmentative system might be "the best." Perhaps both questions can be addressed simultaneously. If augmentative systems are not inherently harmful and may have some preventative value (with respect to communication deficits), there may be no need to verify an inherent deficit prior to augmentative system implementation. Similarly, it is unclear why one must choose one augmentative system over another. Clearly, both signing and graphic modes have advantages and disadvantages. For many learners with severe disabilities, the safest intervention posture may be to assume that both gesture and graphic systems might be helpful, In other words, the learner should be placed in a position to benefit from the advantages of both modes. At the same time, the availability of both modes might mitigate the disadvantages encountered in using only one augmentative system.

In addition to considering the communicative repertoire of one's speaking partner, there may be additional considerations in teaching mixed mode production (Keogh & Reichle, 1985). Interventionists seem to be in general agreement that certain words are difficult to represent in the graphic mode. For example, actions that represent movement such as eat, drink, run, and walk seem particularly difficult because of the difficulty in representing movement. Additionally, certain objects (cup, in the case of drink) which are often included in a drink symbol create the potential for the learner to think that the symbol represents "cup." In sign, however, all of our action examples represent relatively easy signs to produce from a motor perspective. Additionally, they are all somewhat iconic; that is, they represent the movement that one performs while engaging in the action. Since these action signs are relatively easy to produce and guessable to a naive observer, perhaps signing would represent a more efficient mode for those symbols.

Although the use of iconicity serves as a rationale for the inclusion of signs in a mixed mode communication system, it does not provide an adequate rationale for the exclusive use of signs. There seems to be general agreement among those who study sign iconicity that a relatively small proportion of signs within any given sign language or sign system are iconic. If a mixed mode of communication is chosen, the interventionist can select signs to teach that are recognized equally well by signers and nonsigners. This luxury is minimized in the selection of sign as a single augmentative mode.

Providing the learner with a mixed mode communication system has raised objections (e.g., it will confuse the learner). We know, however, that young normal children acquiring language use mixed communication modes. For example, Carter (1973) studied the progression of normal children's methods of expressing communicative intent. She suggested that they differentially produce gestural and vocal behavior to communicate and it is not until around 12–13 months of age that children begin to systematically coordinate their gestural and vocal output. In the intervention literature, Fulwiler and Fouts (1976) reported that their learner spontaneously combined a spoken word with a sign in order to produce a two-word utterance. The fact that this phenomenon occurs spontaneously and appropriately would seem to suggest that mixed mode production may not be confusing (at least for some learners).

Most parents seem very willing to accept the sampling modality strategy because its implementation keeps modality options open for their child until an objective decision can be made. The responsibility of the speech pathologist and teacher is to ensure that all instructional activities implemented during modality sampling have educational value, even if the learner eventually does not use the communicative mode with which the task was associated. For example, a learner who produces an object name using a communication board must match a symbol on the board with some object located in the natural environment. The ability to match, then, is one critical predictor (but not a prerequisite) of success in learning to use a communication board. The teacher's responsibility in implementing a task such as matching is to explain to the parent why participation in an activity such as matching would be beneficial even if a graphic modality (communication board) is not selected for use as an augmentative system.

It is important to begin the process of modality sampling as early as possible in the learner's educational career. If an augmentative communication system is to be utilized as a means of preventing future communication deficits, it must be implemented as early as possible. In order to justify a preventive use of an augmentative system, the interventionist *must be able to document* that the implementation of the system will not decrease the probability of later vocal mode production or language comprehension. Unfortunately, at present we are in need of a data base to provide such documentation.

The notion of modality sampling is not particularly new. Alpert (1980) suggested comparing a learner's ability to benefit differentially from signing and communication board by "teaching specific language responses in two successively trained speech modes." Unfortunately, a sequential strategy may require a significantly greater amount of time to generate sufficient data to compare augmentative systems. Proportionately less time is required for a comparison when both gestural (signs and gestures) and graphic (communication board) mode programs are implemented during separate but contiguous opportunities (Kiernan, 1981).

The position taken here is that there may no *best* augmentative system. A learner may benefit from some gestural and some graphic stimuli to establish or enhance his or her communicative repertoire. If a mixed augmentative system does not appear feasible, the learner's progress in each of two simultaneously implemented sets of tasks that correspond to gestural and graphic modes should provide the basis for a decision that leads to the most efficient augmentative communication system.

Summary

The sets of augmentative decision rules used to determine whether a learner is a candidate for an augmentative communication system differ greatly. The bulk of available rules suggest the consideration of intellectual and current language and speech performance in addition to past performance in a program of speech and/or language intervention. Within these general areas there are often more specific criteria, such as those described by Chapman and Miller (1980) and Shane and Bashir (1980) in the cognitive domain (means-end performance at a specific stage level). Often these criteria are offered with little or no support from empirical work with chronologically young handicapped populations.

All of the decision rules reviewed presume that an augmentative system is a patch that covers a communicative wound. None of the decision rules considers the preventive aspects of augmentative system use and none considers the implications of augmentative communication system use upon the development or remediation of language comprehension deficits.

Although the preceding discussion may seem critical, it is not intended to impugn the usefulness of the rules that have been reviewed. They have provided a firm base of hypotheses upon which empirical tests can be made. The field of augmentative communication is in need of empirical studies that critically analyze the merit of existing decision rules. These investigations must focus on issues that address rule validity and administration reliability. It is hoped that the comparison of major decision rule issues raised in this article will provide an impetus for the delineation of focused empirical questions that will guide future efforts at deriving augmentative decision rules.

References

Alberto, P., Garrett, E., Briggs, T., & Umberger, F. (1983, March). Selection and initiation of a nonvocal communication program for severely handicapped students. *Focus on Exceptional Children, 15*(7), 1–15.

Alpert, C. (1980). Procedures for determining the optional nonspeech mode with the autistic child. In R. Schiefelbusch (Ed.), *Nonspeech language and communication. Analysis and intervention* (pp. 389–420). Baltimore: University Park Press.

Baer, D., Peterson, R., & Sherman, J. (1967). The development of imitation by reinforcing behavioral similarity to a model. *Journal of the Experimental Analysis of Behavior, 10*, 405–416.

Bates, E., Benigni, L., Bretheton, I., Camioni, L., & Volterra, V. (1976). From gesture to first word: On cognitive and social prerequisites. In M. Lewis & L. Rosenblom (Eds.), *Origins of behavior: Language and communication* (pp. 247–308). New York: John Wiley & Sons.

Bates, E., Benigni, L., Bretheton, I., Camioni, L., & Volterra, V. (1979). *The emergence of symbols: Cognition and communication in infancy.* New York: Academic Press.

Bloom, L. (1970). *Language development. Form and function of emerging grammars.* Cambridge, MA: MIT Press.

Bricker, W., & Bricker, D. (1974) . An early language training strategy. In R. Schiefelbusch & L. Lloyd (Eds.), *Language perspectives—Acquisition, retardation, and intervention* (pp. 431–468). Baltimore: University Park Press.

Carter, A. (1973, March). *Development of a presyntactic communication system: A case study.* Paper presented at SRCD meeting, Philadelphia, PA.

Chapman, R. (1978). Comprehension strategies in children. In J. Cavanaugh & W. Strange (Eds.), *Speech and language in the laboratory school and clinic.* Cambridge, MA: MIT Press.

Chapman, R., & Miller, J. (1980). Analyzing language and communication in the child. In R. C. Schiefelbusch (Ed.), *Nonspeech language and communication: Acquisition and intervention* (pp. 159–196). Baltimore: University Park Press.

Corrigan, R. (1976, April). *The relationship between object permanence and language development: How much and how strong?* Paper presented at the Stanford Child Language Research Forum, Stanford University, Palo Alto, CA.

Daniloff, J., Noll, J., Fristoe, M., & Lloyd, L. (1982). Gesture recognition in patients with aphasia. *Journal of Speech and Hearing Disorders, 47*, 43–49.

Fulwiler, R., & Fouts, R. (1976). Acquisition of American Sign Language by a noncommunicating autistic child. *Journal of Autism and Childhood Schizophrenia, 6*, 43–51.

Garcia, E., Baer, D., & Firestone, I. (1971). The development of generalized imitation within experimentally determined boundaries. *Journal of Applied Behavior Analysis, 4*, 101–112.

Guess, D., Sailor, W., & Baer, D. (1978). Children with limited language. In R. L. Schiefelbusch (Ed.), *Language intervention strategies,* (pp. 101–143). Baltimore: University Park Press.

Harding, C., & Golinkoff, R. (1979). The origins of intentional vocalizations in prelinguistic infants. *Child Development, 50*, 33–40.

Illmer, S., Rynders, J., Sinclair, S., & Helfrich, D. (1981). Assessment of object permanence in severely handicapped students as a function of motor and prompting variables. *Journal of the Association for the Severely Handicapped, 6*(3), 30–40.

Ingram, D. (1974, April). *Stages in the development of one-word utterances.* Paper presented at the Stanford Child Language Research Forum, Stanford University, Palo Alto, CA.

Kahn, J. (1975). Relationship of Piaget's sensorimotor period to language acquisition of profoundly retarded children. *American Journal of Mental Deficiency, 79*, 640–643.

Karlan, G. R., & Lloyd, L. L. (1983, June). *Examination of recall comprehension learning by moderately retarded individuals responding to oral and manual cues.* Paper presented at the 107th Annual Meeting of the American Association on Mental Deficiency, Dallas, TX.

Karlan, G., & Lloyd, L. (1985). Unpublished manuscript. Department of Special Education, Purdue University, West Lafayette, IN.

Kent, L. (1974). *Language acquisition program for the severely retarded.* Champaign, IL: Research Press.

Keogh, W., & Reichle, J. (1985). Communication interventional for the "Difficult-to-teach" severely handicapped. In S. Warren & A. Rogers-Warren (Eds), *Teaching functional language.* (pp 157–196). Baltimore: University Park Press.

Kiernan, C. C. (1981). A strategy for research on the use of nonvocal systems of communication. *Journal of Autism and Developmental Disabilities, 11*, 139–151.

Kohl, F., Karlan, G., & Heal, L. (1979). Effects of pairing manual signs with verbal cues upon the acquisition of instruction-following behaviors and the generalization to expressive language with severely handicapped children. *AAESPH Review, 4*, 291–103.

Konstantaneas, M., Oxman, J., & Webster, C. (1978). Iconicity: Effects of the acquisition of sign language by autistic and other severely dysfunctional children. In P. Siple (Ed.), *Understanding language through sign language research* (pp. 213–237). New York: Academic Press.

Lovaas, O., Berberich, J., Perloff, B., & Schaeffer, B. (1966). Acquisition of imitative speech by schizophrenic children. *Science, 151,* 705–707.

McIntire, M. (1974). *A modified model for the description of language acquisition in a deaf child.* Unpublished master's thesis, California State University, Northridge, CA.

Miller, J., Chapman, R., Branston, M., & Reichle, J. (1980). Communicative assessment in twelve (12) to twenty-four (24) months: A reliable method. *Journal of Speech and Hearing Research, 32,* 284–311.

Moore, M., Clark, D., Mail, M., Rajotte, P., & Stoel-Gammon, C. (1977, March). *The relationship between language and object permanance development: A study of Down's infants and children.* Paper presented at the meeting of the Society for Research in Child Development, New Orleans, LA.

Nietupski, J., & Hamre-Nietupski, S. (1979). Teaching auxiliary communication skills to severely handicapped learners. *AAESPH Review, 4,* 107–124.

Owens, R., & House, L. (1984). Decision-making processes in augmentative communication. *Journal of Speech and Hearing Disorders, 49,* 18–25.

Reichle, J. (1984). *Using response prompts to teach early communication skills to severely handicapped learners.* Unpublished manuscript, University of Minnesota, Minneapolis.

Reichle, J., McQuarter, R., & Rogers, N. (1983). *Sign intervention with severely handicapped learners: A review.* Unpublished manuscript, University of Minnesota, Minneapolis.

Reichle, J., & Yoder, D. (in press). Teaching severely handicapped learners operating in sensorimotor stage 4 to use communication boards. *Language, Speech and Hearing Services in Schools.*

Remington, N., & Clark, S. (1983). The acquisition of expressive signing by autistic children: An evaluation of the relative effects of simultaneous communication and sign above training. *Journal of Applied Behavior Analysis, 16,* 315–328.

Rice, M. (1983). Contemporary accounts of the cognition/language relationship: Implications for speech-language clinicians. *Journal of Speech and Hearing Disorders, 48,* 347–359.

Rogers, S. (1977). Characteristics of the cognitive development of profoundly retarded children. *Child Development, 48,* 837–843.

Sailor, W., Guess, D., Goetz, L., Schuler, A., Utley, B., & Baldwin, M. (1980). Language and severely handicapped persons: Deciding what to teach whom. In W. Sailor, B. Wilcox, & L. Brown (Eds.), *Methods of instruction for severely handicapped students* (pp. 71–108). Baltimore: Paul H. Brookes.

Scheuerman, N., Baumgart, D., Simpsa, K., & Brown, L. (1976). Toward the development of a curriculum for teaching nonverbal communication skills to severely handicapped students: Teaching basic tracking, scanning and selection skills. In L. Brown, N. Scheuerman, & T. Crowner (Eds.), *Madison's alternative for zero exclusion: Toward an integrated therapy model for teaching motor, tracking and scanning skills to severely handicapped students* (Vol. 6, Pt. 3). Madison, WI: Madison Metropolitan School District.

Shane, H. (1980). Approaches to assessing the communication of nonoral persons. In R. L. Schiefelbusch (Ed.), *Nonspeech language and communication: Analysis and intervention,* (pp. 197–224). Baltimore: University Park Press.

Shane, H., & Bashir, A. (1980). Election criteria for the adoption of an augmentative communication system: Preliminary considerations. *Journal of Speech and Hearing Disorders, 5,* 408–414.

Stillman, R., Aylmer, J., & Vandivort, J. (1983, June). *The functions of signaling behaviors in profoundly-impaired, deaf-blind children and adolescents.* Paper presented at the 107th Annual Meeting of the American Association on Mental Deficiency, Dallas, TX.

Striefel, S., & Wetherby, B. (1974). Instruction following behavior of a retarded child and its controlling stimuli. *Journal of Applied Behavior Analysis, 12,* 417–430.

Striefel, S., Wetherby, B., & Karlan, G. (1976). Establishing generalized verb-noun instruction-following skills in retarded children. *Journal of Experimental Child Psychology, 22,* 247–260.

Received: January 22, 1985
Final Acceptance: June 11, 1985

Handout III C
Kathleen Stremel-Campbell
1985

RECEPTIVE TACTUAL CUES

Level I	Suggested Cue
Your identification (object)	specific to the individual
"Hi" -approach cue	lightly rub his hand
"Bye" -termination cue	lightly rub or tap lower shoulder
"Out/Down" -change in placement cue	lightly pat bottom or pull on arms
"Eat" cue (object)	touch both lips twice
"Change" or "Bathroom" cue (object)	gently tug at waistband
"Up"	gently tug on hand and arm
"No"	tap firmly twice on outer wrist

Level II	Suggested Cue
"Name" or possession cue	touch chest
"Want more?" cue	"M" fingers stroke from his knuckles to fingertips
"Give me"	"M" fingers stroke inside of his fingertips
"Take it"	tap twice (with one finger) at mid hand
"Let go"	shake his wrist with thumb and forefinger
"Look for"	put your hand over his flat outer hand and move from side to side
"Go"	gently guide elbow
"Stop"	take both hands and firmly put them down
"Finished" (object)	gently guide child's hand to push away the object (at forefinger)
"Sit"	gently push twice at shoulder
"Stand"	Gently stroke upward on botharms
"Play-interaction"	gently rub rib area with both hands
"Drink" (object)	touch botton lip and gently push up
"Bed/sleep" (object)	gently stroke both eye lids
"Bath"	gently rub between the breast bone
"Clothes on"	with your fist stroke or tap location of clothes on body

Level III	Suggested Cue
"Put in"	
"Take out"	
"Close"	assist child to turn his hand downward using one finger at his wrist
"Work" (object)	
"You are changing locations"	
"Wipe your mouth" or "I'm going to"	rub your fingers back and forth across the child's lips

Programmed Environments Curriculum
Tawney, Knapp, O'Reilly, Pratt

ued Commands Chart

Uses: 1. To select functional commands to teach in Following Cued Commands.
2. To suggest commands for aides and volunteers to use frequently.

COMMANDS	MATERIALS/SITUATION	SUGGESTED CRITERION
IT OWN). a oint to place)	S is standing near chair, mat, toilet, swing.	S sits in the indicated place for at least 5 seconds.
ST ID (UP). ra e your arms/hands)	S is sitting on floor, in chair, in swing.	S stands up and remains up for at least 5 seconds.
LE S GO/COME ON. (b kon and start walking)	S is sitting or standing next to you.	S walks with you at least 5 feet without stopping.
G OVER THERE. (nt and nod your head toward p ce)	S is standing by you.	S walks to the indicated place (10 feet) and stops.
LD MY HAND. retch out your hand)	S is standing or sitting by you.	S places his hand in/on yours for at least 5 seconds (while walking or balancing).
OP/NO. hake index finger)	S is engaging in undesirable behavior.	S stops the behavior for at least 5 seconds.
OOK. point to place)	S is near a window or some stimulating target.	S turns his head in the indicated direction for at least 5 seconds.
IVE ME ______ . hold out your hand and point to object)	S is holding an object.	S releases the indicated object in your hand.
TAKE ______ . (hold out object)	S's hands are empty, but you are holding something.	S takes the indicated object and holds it for at least 5 seconds.
GET ______ . (point to object)	S is near an object: holding it; it is hanging on a hook or rack.	S goes to and picks up the indicated object.
BRING ______ . (beckon to S, and point to object)	S is away from you but is holding something.	S comes to you and releases the indicated object in your hand.
OPEN ______ . (point to object/lid)	S is by a closed: door, box, drawer.	S pulls the indicated door or lifts the lid at least halfway open.
CLOSE ______ . (point to object/lid)	S is by an open: door, box, drawer.	S pushes the indicated door shut or lowers the lid all the way.
PUT ______ HERE. (point to container or area)	S is holding an object in/near a container (box, drawer, can) or an area with boundaries (sheet of paper, shelf).	S puts the object in/on the place indicated.
TAKE ONE. (gesture to choices)	Offer S choices (plate of cookies, tray with cups of juice).	S selects one item (does not grab or snatch).

Chart *(continued)*

COMMANDS	MATERIALS/SITUATION	SUGGESTED CRITERION
GIVE ______ to ______ . (hold out object to S and point to someone else)	S's hands are empty and he is near another person.	S takes the object and gives it to the indicated person.
LET'S TRADE. (hold out object to S and point to his object)	S is holding an object.	S gives you his object and takes the indicated one.
GO PLAY. (point to toy area)	S is unoccupied.	S goes to the indicated area and picks up a toy.
WIPE ______ . (point to rag and spill)	S is by a spill or dirty area and the rag is near.	S takes the rag and rubs it back and forth on the indicated place.
PULL ______ . (point to object/part)	S is near or has an object with a string or part to pull: pull-toy, talking doll, light with pull string.	S pulls the string/part until the toy/object is activated or stops.
PUSH ______ . (point to object/part)	S is near or has an object with a button or part to push: doorbell, elevator button, on-off buttons.	S pushes the button until the object is activated.
TURN ______ . (point to object and indicate correct direction)	S is near or has an object with a handle or top: doorknob, faucet, jars, tubes, thermos bottle.	S turns/screws or unscrews as indicated, as far as needed.
POUR ______ . (point to pitcher then to empty container(s))	S is near a light pitcher (containing sugar, sand, salt, water) and large empty cups or bowls to receive the contents from the pitcher.	S pours all of the contents into the indicated containers.
WRITE.	S has a large piece of paper and markers: felt tip pen, pencil, crayon.	S makes at least one mark on the paper without marking the table.
(command appropriate to the object)—point to the object and model or gesture its use	S is holding or is near a particular object: see Common Objects Chart for suggested objects.	S uses the object as indicated.

ANN SILVERRAIN, M.ED.
Infant Parent Trainer for the
Visually Handicapped

Education Service Center, Region 20
1314 Hines Avenue
San Antonio, Texas 78208
Phone: (512) 828-3551

December 7, 1982

THE USE OF "SYMBOL SHELVES" IN TEACHING COMMUNICATION WITH MULTI-HANDICAPPED CHILDREN

Multi-handicapped children often have no usable communication system other than crying, smiling, hitting, biting, etc. Teachers who are used to traditional forms of communication using speech or speech and sign language are often frustrated in finding a way to "get through" to a nonresponsive multi-handicapped child.

The focus of this discussion is on children who are ambulatory or at least have some form of independent locomotion, have some form of grasp, those who have no or very little speech, those who have shown even some minute amount of anticipation of any event; for example, at home child goes to a place and waits where a pleasurable event routinely occurs or where favorite objects or food are kept.

I have seen many classrooms for the severely and profoundly handicapped look like this: there is a general routine to the day which the teachers follows: for example, receiving child off the bus, going to physical therapy, going to lunch, outdoor time, sensory stim time, etc. and finally a time to load on the bus. During the activity times the teachers or aides present various objects and do various exercises with the child. The main element that is missing in this scene is real communication. This child is put through the motions of the day by the adult in a way such that communication is one-way - - - from teacher to child, not between teacher and child. Certainly when the child cries and pitches a fit, that is telling adult "I don't want this anymore", but where is the dialogue? Communication is a two-way street. What does the child have to communicate about?

Stop to ask yourself: "What is it that the child really enjoys doing?" I have seen some children that don't seem to enjoy anything. However, you have to be creative in finding out what they enjoy other than self stimulation, of course. The second step is to use what the child enjoys to build a dialogue.

In my experience I have found some of the following things to elicit pleasurable responses from low functioning, multi-handicapped children: bouncing on the trampoline with the child, going outside and swinging, or being indoors and swinging on a hammock, being pulled in a wagon, or being rocked on a vestibular board, playing with a vibrator, or being rolled around prone on a scooter board, being tickled by the teacher, or wrestling with the teacher, things like eating favorite foods and/or drinking favorite juices. Sometimes the child favors some particular tactile type of stimulation like playing with sticks or macaroni noodles. So, check into many different things that you think the child is going to enjoy.

The Purpose of the Symbol Shelf:

1. To develop a two-way communication in which the child can be expressive symbolically even though he does not have speech.
2. To enable the child to feel some sense of control over his or her environment.
3. To serve as a possible bridge to a more formal communication system, either speech and/or sign language, or some form of total communication using speech and sign, or using a pictorial system of communication.

How to Set Up the Symbol Shelf:

1. Find out what the child enjoys and be creative in your experimentation.
2. Fit all of these enjoyable things into a classroom routine.
3. Select obvious objects as "symbols" that can be used in the activities themselves. This is an important point. You want to build an association in the child's mind between the object and the event itself so that you are building in anticipation within this routine. Anticipation is a very basic element of communication skills.
4. Place the chosen objects being used as symbols in a sequence on a shelf that the child can reach. Lay them out from left to right in order of the day's events.
5. Have a box with a lid next to the shelves which we will call the "finished" box where the child puts objects away after each event is over.

An Example Scenario:

The creative teacher has experimented and found that Patty enjoys these activities: swinging outside, rolling over a large bolster, bouncing on a trampoline, drinking juice, eating applesauce at lunch and not much else, riding on the bus, playing tickle games with the teacher, playing in a dark room with colored flashlights and internally lit balls, and squeezing balloons.

The teacher structures a daily routine for the child. For example, after Patty gets off the bus, she first goes with the physical therapist to gross motor, or she may have it done there in the classroom. Then there is a fine motor period, then comes juice time, then a short outside time, then lunch, after lunch an interaction time with the teacher involving tickle games, then visual and perceptual skills time, and then it is time to get on the bus and go home.

With this daily routine structure in mind, and also with Patty's favorite activities in mind, the teacher determines which objects she will put on Patty's symbol shelf. Whenever possible she tries to pick objects which are actually used in the activities although occasionally one of the objects must be an arbitrary symbol. Since Patty likes rolling over large bolsters, bouncing on the trampoline, and being pulled on her scooter board, the teacher lumps these into the gross motor time which is Patty's first major activity of the morning after she gets off the bus. For this segment of Patty's morning, the teacher has chosen a tennis terry cloth wrist band to symbolize gross motor time. This is an example of an arbitrary symbol, but since it will be used consistently every time Patty goes to do gross motor activities either with the therapist, the aide, or with the teacher, she will begin to associate the wrist band with some of her favorite gross motor activities. For the fine motor period the teacher has chosen to use a small balloon that has been blown up just a bit with a little air for Patty to be able to squeeze it. She tapes this to a little cardboard just so that the little balloon won't blow off the shelf when people walk by. However, Patty is easily able to pick it up off the shelf. Although the fine motor period will include handling other types of objects, the teacher plans to always at least start out the period of time with squeezing small balloons, since that is one of Patty's favorite activities. For juice time, the teacher decides to use a small plastic cup which Patty will get off the shelf and carry to the snack table. The outdoor period will be symbolized by wearing a cap of some kind. This can be a baseball cap since it is good for hot weather also. The teacher has chosen a spoon to use as a symbol for lunchtime. The interaction period after lunch, which we will call "tickle games" with the teacher, will be symbolized by a red bandana which the teacher will place around Patty's neck before they begin their interaction. This is another arbitrary symbol, but one which Patty will come to associate with this period during the day. After that comes the visual perceptual skill time in which the teacher has chosen to use a flashlight on the symbol shelf. For going home on the bus the teacher decides she will use a shoulder-strap purse. She is going to ask Patty's mother to have her wear the purse in the morning so that they can take it off and put it on the hook with her coat by the symbol shelf. At the end of the day she will put her coat on and put her purse on---- that will symbolize getting on the bus.

Once the teacher has decided the routine structure for the day, the symbols to accompany Patty's favorite activities, and has it set up and ready to go, this is the way it would look on the first day; the first week; etc.: Patty comes into the room off the bus, the teacher leads her to a hook which is strategically placed next to the symbol shelf; she takes off her little purse; she manipulates Patty through hanging it on the hook and manipulates her through hanging her coat on the hook. When it is time for Patty to have her gross motor therapy, the teacher, or it could be the therapist, leads Patty by the hand to the symbol shelf. She places Patty's hand on the wrist band and helps her to put it on her wrist; then they go immediately to the gross motor area (whether it is in the gym or in the classroom). The teacher makes it a point that Patty does her favorite gross motor activities each day in addition to the new things that she will be working on with the therapist. It is very important when using the symbol shelf (I can't emphasize it enough) that the child has to enjoy the things that are used in the events of the day. Otherwise, the symbol shelf will not work because the child will not develop the association between the object and the event. When the gross motor period is over the therapist brings her back and together they take her wrist band off. The therapist manipulates her through putting it into the finished box and says something like "play time is finished" and they put it in the box together.

Next it is fine motor time. The teacher takes Patty and together they go to the symbol shelf. She places Patty's hand on the partially inflated balloon, and Patty carries it to the area where they do fine motor (such as to her corner chair and floor table). She brings out more little balloons for Patty to play with to introduce the fine motor time. Then they do whatever else is on the schedule for fine motor. After that period is over the teacher takes Patty back to the symbol shelf where the finished box is. They lift the lid of the box, put the balloon in, and talk about "the balloons are finished".

The next activity in the routine of the day is juice time. The same thing happens here. The teacher manipulates Patty through getting her cup off the shelf, and using the cup to drink the juice. After juice is over they put the cup in the finished box together. During each of these initial introductions to the symbol shelf, the teacher always talks (or talks and signs) to the child in short sentences, talking about the object, what they are going to be doing; a lot of language can be built around these objects themselves.

After juice time it is time to go outside. Teacher and Patty go together to get the baseball cap off the shelf. She puts the cap on Patty and then immediately they go outside to go swinging. After that time is over they come back in, bring the cap and put it in the finished box together.

Next is lunchtime. Patty is taken to the symbol shelf, they get the spoon off the shelf together. (Also, some teachers find that using a bib to symbolize lunchtime is easier than using a spoon if the child is going to be dropping a spoon all the way down the hall.) They get the spoon, carry it to the lunchroom or wherever they eat, bring the spoon back after lunch and put it in the finished box.

The next activity on the schedule is the interaction time or tickle games with the teacher. They go to the symbol shelf, the teacher helps Patty pick up the bandana, teacher puts it around Patty's neck, they talk about what's going to happen, and they go immediately to the mat on the floor where they routinely do this activity. When it is over they take the bandana to the finished box. Same thing with the visual perceptual skill time during the day; she helps Patty get the flashlight and they take it into the closet. Patty plays with the flashlight initially. Then they will do the other perceptual skills that they do during that time, come back to the room, and place the flashlight into the finished box.

The last activity is going home on the bus, so Patty is taken to her hook where her coat and her purse are hanging, she puts these things on with the teacher's help and waits for the bus to come.

This kind of routine (where the teacher manipulates the child through using the symbol shelf) will have to be done over a period of time; depending on how quickly the child begins to make associations determines how long the teacher will have to continue the manipulation. Some children will take much longer than others. I would say that after six months of doing this every day, if the child has not caught on at all, or is not showing any sign of anticipation in the routine of the day, then it could be discontinued as an appropriate form of communication for the child. What happens in many cases, though, is that children, when they know their favorite activities are coming up, will begin to go to the symbol shelf on their own or at least walk towards it or stand around in the area expectantly. The teacher must look for the subtle signs of anticipation, such as when Patty spontaneously picks up the balloon; or has a bandana placed around her neck and begins to smile. Maybe she will take the teacher by the hand and lead her to the tickle game area or lead her by the hand to the visual perceptual skill area.

The ultimate function of the symbol shelf is for the child to be expressive symbolically using the objects. Eventually we want to get the child to the point where she will spontaneously go to the shelves and pick out an object. She may just hold the object, or if she brings the object to the teacher or to the adult, that's even better. At this point when a child is showing this kind of anticipation and initiative, the teacher must at first respond to whatever the child brings, even though it may be out of order. For example, if Patty, when she comes in the morning, goes directly to the symbol shelf and grabs her flashlight (even though that does not come until the afternoon) the teacher needs to go ahead and do that activity with Patty. This way Patty is learning that she does have some control over her environment; that she can have a two-way dialogue with the teacher. So, what is happening here is that the teacher must, at least for a while, become "the slave" of the child when she is using the symbol shelf. Later the teacher can build in some kind of sign for Patty to know that she has to wait for this activity; maybe a sign for "later", because it would obviously be inconvenient to always do the activities at Patty's whim. But at first the teacher is going to have to do it that way.

At the end of the successful use of the symbol shelf, we have a child that has learned to anticipate the events of the day, has associated hopefully some verbal language with the objects themselves, is becoming more verbal because of this, or is signing more, or is more communicative with adults through gestures. The child is coming to associate adults with these pleasurable experiences and will take the objects to the adult or lead the adults by the hand to let the adult know what he wants. For many children who have no awareness of adults at all, or do not interact with adults at all, this is a gigantic step.

From using the symbol shelf, it is much easier to make a transition to other forms of communication such as spoken language or using pictures instead of objects, or using gestures and sign language. The idea with the symbol shelf is to get that initial idea of what communication is all about to a low functioning, multi-handicapped child. It is one way to break through the barrier of the child's not caring to communicate at all. The reason the system works is twofold: first, the teacher puts into the daily routine the things that the child enjoys doing; and second, it works because there is continuity and consistency in the system. Ultimately, any classroom should have as its context or as its general principle the idea of communication, even at a very low level throughout the day for the multi-handicapped child. The system can also be adapted to home use. If you can imagine your own frustration at having someone else plan your entire day and shove things at you that you may or may not enjoy, this will give you an idea of the frustration that some of these children may feel. The symbol shelf at least gives them the idea that they have some control, that they can communicate what they want, and that communication can be fun.

TEACHING TIME CONCEPTS THROUGH USE OF CONCRETE CALENDARS

Texas School for the Blind
Deaf-Blind Annex
October, 1981

Robbie Umholtz
Dale Rudin

Each of us tends to organize our days in ways that make our lives more productive or more comfortable. Often times when programming for multihandicapped students the organization of the day is left up to the adult responsible for the specific classroom or dorm group. There may be a loose, rigid or flexible structure for the day in the mind of the adult, however, the student is unaware of what is going to happen during that time frame. Without being able to anticipate the day's activities the student is led through his or her day with very little control over it let alone any understanding of the events that will take place. With this in mind, it becomes easier to understand why some students resist activities or appear to be disorganized or need to be led from one activity area to another. Having a concrete representation of the days activities should serve to reduce student anxiety or apathy about activities for the day.

When students have little, if any, formal communication system it is difficult to ascertain what time concepts the students are aware of. Are they anticipating events to follow? Do they understand that concrete symbols or drawings are representations of activities? Do they have an understanding of past, present, and future? The pages that follow are a beginning draft of a scope and sequence for teaching time concepts using concrete calendars. The goals and objectives are written with deaf-blind students needs in mind. Therefore, many of the suggestions for materials are geared towards that specific population.

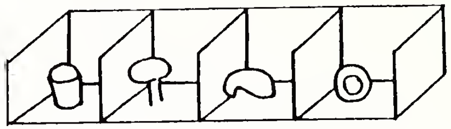
The goals and objectives that follow are divided into sections that coincide with complexity of time concepts as well as the student's representational abilities. Beginning work is focussed on using objects to represent activities that will follow. (For more information refer to work of Jan Van Dijk.) The objects may be part of the materials used in the activity or more arbitrary symbols based upon the cognitive level of the student. Representation of the activities becomes more and more complex from objects, to tracings, to drawings, to pictures or photographs and then to the printed word.

At the same time the teacher is working on building the student's representational abilities so is he or she building in time concepts. The focus is primarily on what is presently happening, what has occurred in the past, and what will happen in the future. The trick is to use concrete representations to teach abstract time concepts and move from a simple morning calendar to a month calendar.

In order to use the following objectives it is mandatory that the teacher know the level at which the student is functioning. This is not presently an assessment tool. It is presented in a loose hierarchical structure but the teacher would need to pick the goals and objectives that are appropriate for each student. This would also mean that the teacher would need to pick the conditions for the objective that are most appropriate depending upon the student's present competencies. Moving from a morning to a daily to a weekly or monthly calendar presupposes that the previous skills have been integrated and are fully part of the student's repetoire of cognitive skills. For the monthly and weekly calendar many of the objectives are repeated because it seems to take the students a while to apply what has been previously learned to a new, larger format that encompasses more distance and time.

It is hoped that through the understanding of time concepts and calendar activities the student will be able to have more control over his or her own activities. Organizing the day's activities, scheduling future events, and being able to discuss what has or will be happening can only lead to a better self-image and more independence. The expansion activities at "Calendar Time" are numerous (see attached page) and are only limited by the imagination of the teacher.

AREA OF EMPHASIS: CALENDAR SHELF FOR DAILY ACTIVITIES -- OBJECT SYMBOLS

LONG TERM GOALS	SHORT TERM OBJECTIVES	CONDITIONS TO OBJECTIVES	MATERIALS/SUGGESTIONS
I. Student will use object symbols and a calendar shelf to represent a schedule of activities.	I. 1. Will indicate an activity is to begin by picking up appropriate object symbol after the student and teacher have walked to the calendar shelf.	I. 1. a. manipulation by adult b. following a tactual prompt c. following a gesture or point d. independently	Calendar shelf may be a plain wooden shelf with object symbols placed on shelf in sequence of the activities that will occur. Dividers may be used for blind students so they can feel the divisions as to where the object symbol is placed. Can use a calendar box:  The calendar may first be started with morning activities and expanded to include afternoon and evening activities. Use objects that are part of the activity to begin with then move to more arbitrary symbols.
	2. Will move toward the area in which the activity will occur with the object symbol.	2. a. coactively with teacher b. following a gesture or point c. independently	
	3. Will indicate that an activity has been completed by returning the object to the appropriate space on the calendar shelf or by putting the object symbol in a "finished box" or by covering the object symbol.	3. a. manipulation by adult b. following a tactual prompt c. following a gesture or point d. independently	

AREA OF EMPHASIS: CALENDAR SHELF FOR DAILY ACTIVITIES -- OBJECT SYMBOLS (Con't)

LONG TERM GOALS	SHORT TERM OBJECTIVES	CONDITIONS TO OBJECTIVES	MATERIALS/SUGGESTIONS
	4. Will demonstrate understanding of the next activity by spontaneously getting an object from the calendar box and moving to the activity area or performing the activity.	4. a. manipulation by adult b. following a tactual prompt c. following a gesture or point d. independently	4. Needs to place a "reward" activity in the next section to move kid to this step, i.e. object for eating cookie or self-stimulation.
	5. After being given objects representing morning activities the student will arrange the objects on the calendar in the sequence in which the activities have occurred.	5. a. manipulation by adult b. following a tactual prompt c. following a gesture or point d. independently	5. This can begin with morning calendars and expand to include the afternoon and whole day.
	6. Will choose a preferred activity and demonstrate understanding of being able to make a choice by choosing one out of two object symbols and placing it in the calendar.	6. a. manipulation by adult b. following a tactual prompt c. following a gesture or point d. independently	6. The student, at this point, is beginning to help set up own calendar for the day. Can expand this objective to include sequencing the chosen activities of the day.

Nonverbal Prelinguistic Communication

A guide to communication levels
in prelinguistic handicapped children

September 1983

Verne A. Duncan
State Superintendent of Public Instruction

Oregon Department of Education
700 Pringle Parkway SE
Salem, OR 97310

Oregon Program for Deaf-Blind Children
Oregon Department of Education

Federal law prohibits discrimination on the basis of race, color or national origin (Title VI of the Civil Rights Act of 1964); sex (Title IX of the Educational Amendments of 1972 and Title II of the Vocational Education Amendments of 1976); or handicap (Section 504 of the Rehabilitation Act of 1973) in educational programs and activities which receive federal assistance. Oregon laws prohibiting discrimination include ORS 659.150 and 659.030. The State Board of Education, furthermore, has adopted Oregon Administrative Rules regarding equal opportunity and nondiscrimination: OARs 581-21-045 through -049 and OAR 581-22-505.

It is the policy of the State Board of Education and a priority of the Oregon Department of Education to ensure equal opportunity in all educational programs and activities and in employment. The Department provides assistance as needed throughout the state's educational system concerning issues of equal opportunity, and has designated the following as responsibile for coordinating the Department's efforts:

Title II—Vocational Education Equal Opportunity Specialist

Title VI and Title IX—Coordinator, Title IV, Civil Rights

Section 504—Assistant Superintendent, Division of Special Education and Student Services

Inquiries may be addressed to the Oregon Department of Education, 700 Pringle Parkway SE, Salem 97310-0290 or to the Regional Office for Civil Rights, Region X, M/S 106, 2901 Third Avenue, Seattle 98121.

ACKNOWLEDGMENTS

The prelinguistic sequence was created as a result of the concern expressed by several teachers of deaf-blind children who were functioning at the pre-language level. During meetings, a sequence was identified and communication strategies were developed centered around the basic modes used by these children. Teachers patiently used the information generated during these meetings and willingly shared their results. The sequence is a product of those work sessions. Appreciation is extended to the many teachers who devoted time and energy on behalf of deaf-blind and severely multihandicapped children. A special thanks to the supervisors for allowing their teachers to participate.

The following programs and teachers participated in this project:

- Douglas Education Service District Program for Multihandicapped
  - Carleen House
- Jackson Education Service District Program for Visually Impaired
  - Sharon Anderson
  - Mark McKiernan
  - Kathy Wasserman
- Fairview Training Center
  - Pat Brush
  - Mary Ann Heffernan
  - Karen Farwell
- Oregon School for the Blind
  - Jan Burks
  - Mary Reid
  - Linda Petersen
  - Lynn Kitagawa
  - Julie Cook
  - Elizabeth Owens
  - Pat Troisi
- Portland Regional Programs
  - Phil Schweigert
  - Paula Yocum
  - Carol Reide
  - Joe Hopkins
  - Van Woolf
  - Margie Robertson
  - Sandra Pemberton
- Salem Public Schools
  - Bev Kroop, Bev Wittler
- Eugene Public School, Regional Program for Visually Impaired
  - Christine Carlson

This project would not have been possible without the guidance and expertise of Kathleen Stremel-Campbell who has served as our communications consultant for three years. Kathleen devoted her time and energy and shared her knowledge by leading us through several work sessions in addition to the productive time she spent in classrooms.

Maurine Otos, Coordinator
Oregon Programs & Services for
Deaf-Blind Children & Youth

Contents

Acknowledgments iii
Introduction 1
Master Chart: Nonverbal Prelinguistic Communication Sequence 5
Response Summary 15
Reference Chart: Levels of Prelinguistic Communication 16
References 19

INTRODUCTION

Purpose and Rationale

The nonverbal prelinguistic communication sequence is designed as a guide to help parents, teachers and others encourage communication in children who do not have a language system.

Many multihandicapped sensory impaired children and youth have not reached the level where they can communicate through speech or sign language. They need to use more concrete ways to communicate with others—to express likes or dislikes, to make choices and requests and to indicate protest. They also need concrete ways to be informed that a specific activity is going to begin or that it has finished.

Such modes of communication can include an array of facial expressions including smiles, frowns, cries and other vocalizations, plus body movements, gestures, looking, or touching. Objects, pictures and environmental cues can also be used for communication.

All children respond to things and people in their environments. Our reactions to these responses can help prelinguistic children discover that they too can have an effect on and some control over the people and things around them.

Everyone who interacts with such children can provide meaningful experiences for them, and can create an atmosphere that will encourage the child to acquire intentional communicative skills.

This sequence focuses on some of the communicative modes that can be used effectively with multihandicapped sensory impaired children and youth who function at a prelinguistic level. It includes nine levels of communicative behavior that correspond closely to the stages within the sensorimotor period as described by Piaget.

Levels

These levels begin with the responses a child gives to stimulation from others or from things in the environment, called reflexive-reactive responses. Others interpret these responses to learn the child's likes and dislikes, such as hunger, comfort, pleasure and displeasure. Although the child is not intending to communicate and is merely responding in a reflexive-reactive manner, the adult should attempt to interpret the signals and respond by continuing or discontinuing the interaction (providing food or drink, changing the child's position, holding or playing with the child, etc.). By consistently attending to the child's responses and behavior, the adult is laying a foundation for intentional communication to develop.

By consistently responding to the signals a child gives, we teach the child that his or her behavior has an effect on other people and things. We also teach the child to anticipate routine events and activities if we always provide the same signals or cues before they happen. For example, consistently showing the child his cup before giving him a drink will eventually tell him that he is about to get a drink.

These cues help to establish a relationship between cause and effect, a concept that appears to be a prerequisite to intentional communication. When the child recognizes the association between specific cues and the events that follow, he or she will eventually begin to use them to indicate, for example, a request for more juice or more food. Eventually the child will learn to use specific signals to obtain attention and to continue an interaction.

Communicative Modes

This sequence arranges the communicative modes into three types: (1) tactile, which includes touch cues, tactile gestures and tactile signs; (2) objects, including environmental cues and pictures, and (3) gestures which include imitation and co-active movement, plus pointing, reaching and other natural gestures that may lead to the beginning of formal signs.

Each mode develops into language represented by abstract symbols and includes both receptive and expressive forms of communication. By the time a child has reached level IX, a formal language system is developing. Touch cues have developed into tactile signs for a deaf-blind child, objects may be represented by pictures or tactile symbols, and gestures have developed into sign language.

It is important to note that a child can be functioning at more than one level. It appears that every new concept or word must be perceived and understood at all of its prelinguistic and functional levels before a formal sign acquires a true communicative meaning. This means that the child who has learned to use the sign "cookie" to get a cookie will probably not learn to use the sign for juice until he has first learned that he can get the juice by pointing to it or taking the adult's hand to it.

It is also possible for a child to use more than one mode of communication. For example, the adult might give a touch cue to obtain a child's attention, and then give the child a shoe, touching the child's foot (meaning: put your shoe on). However, the child cannot put on his shoe and extends it to the adult (meaning: help me).

The amount of residual vision a child has will also determine the mode to be used. A child with adequate sight will respond to visible gestures and objects. A deaf-blind child may need touch-cues, tactile gestures and the opportunity to touch objects.

Although speech has not been included in this sequence, it is not to imply that multihandicapped and sensory impaired children cannot learn to talk. A few do. However, most of the children for whom this sequence is intended cannot learn to use speech to communicate. This sequence is intended to provide a framework for alternative communication systems for severe and profoundly multihandicapped sensory impaired children and youth.

Assessment

The sequence can be used to assess the child's current level of functioning and to plan goals and objectives for teaching communication. Some of the examples described may help the observer structure the environment so that the child has an opportunity to respond in some way.

It is important to observe the child in both structured and natural environments. For example, a **structured assessment** at level I might include presentation of various stimuli during a sensory stimulation session. A **natural assessment,** which probably gives more accurate information, would include observation of the child's responses in naturally occurring and routine activities. For example, a child who doesn't respond to smells from bottles containing scents may respond to food smells at mealtime. Another child who doesn't track a penlight may use his eyes to follow a person who is carrying a tray of food. Both children respond in a natural situation but do not respond when the situation is out of context.

Assessing the other person's reaction to the child's response is also very important. In fact, how the other person reacts is the most important component in helping the child understand the relationship between his behavior and the effect it has on others. When a person plays with a child—tickling, bouncing, playing pat-a-cake—the child probably responds by smiling, reaching for the

other person's hand, crying or pushing the person away. These behaviors indicate enjoyment or displeasure, although they may be unintentional.

If the adult responds appropriately to the child's signal, the likelihood that the child will repeat that signal increases. On the other hand, if the child's signals are misinterpreted or ignored, the child is far less likely to repeat that signal.

Therefore, when doing the assessment, it will be helpful to comment on the type of setting in which the behaviors occur and to note the other person's response to the child.

The assessment can be recorded in two ways. There is space on the sequence chart for recording the child's response to each item. It might be helpful to mark the date by each item as it is accomplished. This will allow you to use the sequence over a longer period of time and as an ongoing record. The child's progress can also be recorded on the bar graph provided. This will help to determine the modes successfully used by and with the child. Color coding each time the assessment is accomplished will also give you a record of the child's responses over a period of time.

Summary

A primary focus of this sequence is to integrate and sequence the modes of communication currently being taught to deaf-blind and other multihandicapped sensory impaired children. It incorporates and sequences touch cues, tactile signs and gestures, objects and pictures, including the 'calendar' program, the active stimulation concept and gestures, co-active movement, and imitation.

The sequence also emphasizes the importance of structuring the environment to allow children to make the association between cause and effect so they learn that they can control what happens to them. They will also have a system by which they can learn to anticipate activities and events.

It is critical that those who interact with these children become good observers of the children's responses to people and things and that these responses receive consistent attention.

The sequence can be used to track communicative development, to observe the mode used most successfully and to plan a child's communicative goals and objectives.

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Child's name ____________________

Code:
+ = Accomplished
− = Negative response
0 = No response

LEVEL I — (0-1 month)

REACTIVE-REFLEXIVE RESPONSES

Nonintentional Communication

Child's attention or response to stimulation may communicate pleasure sensations likes, dislikes, wants to another person.

Communicative Behaviors

1. Gives any response to at least one stimulus or combination of stimuli. Responses may be inconsistent.
2. Repeats the same response to repeated presentations of the same stimulus when the conditions are the same.
3. Repeats the same response to a number of different stimuli. (Response may be generalized to more than one stimulus.)
4. Gives at least two different responses to the same stimulus. (The stimulus creates generalized responding.)

Examples of Communicative Response

Visual cues	**Tactile cues**	**Motor-kinesthetic cues**
a person's face	a touch by a spoon or cup	being hugged
lights	a person's hand	swung in a blanket
moving objects	a vibrator	rocked
	washcloth	bounced
	warm air	
	lotion	

Other cues may include taste, smell or auditoy sensations.

The child's responses may include:

startling	turning away	stopping cries
increasing movement	smiling	visually fixating
quieting	fussing	dilating pupils
leaning forward	crying	

Modes of Communication	1. +	1. −	1. 0	2. +	2. −	2. 0	3. +	3. −	3. 0	4. +	4. −	4. 0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile a. Reacts to touch, may startle.													Touch on arm, mouth, leg, hand, etc.	Startles.	
b. When approached and touched gently, accompanied by a soothing voice, child attends and does not startle.													Touch on arm to let child know person is present.	Quiets, smiles	
c. Reacts to touch cues paired with environmental cues													Touch to eat paired with smells, bib, location, sees food, etc	Increases movement, ceases fussing, etc.	
Objects a. Quiets, fixates or shows excitement on sight of or contact with motivational object.													Is shown cup, spoon, food, person, toy, etc	Quiets, visually fixates, increases movement.	
b. Gives some type of response to at least one familiar object paired with environmental cues.													Is shown cup - bib placed around neck - smells food, is placed in chair.	Becomes excited Smiles.	
Gestures and Signs a. Allows other person to move child through whole body movements that are in the child's repertoire. (Movements are in sequence.)													Is rocked back and forth, then bounced Same sequence repeated daily by same person, at same time and in same location.	Does not resist interaction.	
b. Quiets, fixates or shows excitement on seeing care giver or familiar person													(Self explanatrory.)		

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Code:
+ = Accomplished
— = Negative response
0 = No response

LEVEL II — (2-3 months)	Communicative Behaviors	Examples of Communicative Cues and Responses			
NONSPECIFIC ANTICIPATORY RESPONSES Nonintentional Communication Child begins to anticipate that a familiar action/interaction will occur following specific stimuli.	Gives some type of anticipatory response to at least one stimulus associated with a specific routine or with familiar stimuli in the environment. (Response may be a continuation of a movement.)	**Auditory:** Familiar voice or environmental sounds. →	Child searches for sound momentarily. If sound stops, quiets, smiles, fusses.	**Visual/auditory:** Person puts hands out, says "up" when child is lying down or sitting. →	Child quiets, smiles, etc.
		Smell, taste: After giving child several bites of food or sips of drink, person pauses between spoonfuls. →	Child opens mouth, leans forward, vocalizes, turns head away.	**Visual:** Bottle and toy presented. →	Child looks from one to the other.
		Tactile: Other person tickles, hugs, rubs lotion, brushes child's hair, then stops. →	Child makes any movement or sound, smiles or leans toward person when inter-action stops.	**Motor kinesthetic:** Child is rocked back and forth, bounced a few times, then swung in a blanket or in arms. (Routine always the same.) →	Child makes any movement or sound, or gives any reaction during pause in the activity.

Modes of Communication	+	—	0	Examples of Possible Interaction Stimulus	Response	Description of Actual Interaction
Tactile						
a. Gives some type of anticipatory response to at least one specific touch cue, paired with specific environmental cues when presented by a familiar person prior to a routine activity.				Touch cue is given to indicate pants will be changed, paired with placement on changing area, sees diaper.	May quiet, fuss, smile.	
Objects						
a. Gives an anticipatory response to at least one familiar object, paired with other environmental cues.				Spoon is in front of child; bib is on and child is in chair at the table.	Open mouth, lean forward, reach, turn away.	
b. Shifts visual attention between objects.				Bottle and toy presented.	Looks from one to the other.	
c. Accidentally moves object with general body movements.				Sees mobile or toy move, hears sound.	Becomes excited, waves arms, kicks feet.	
Gestures and Signs						
a. Makes any anticipatory movement or reaction during pause in a familiar "whole body" coactive movement sequence.				Child is rocked back and forth, bounced a few times, then swung in a blanket or in arms (routine always the same). Pause before routine is completed.	Child makes any movement or sound, or gives any reaction during pause in the activity.	
b. Attends/alerts to familiar gesture made by other person.				Familiar person puts hands out, says "up".	Child quiets, smiles, changes position, etc.	

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Code: + – Accomplished
– – Negative response
0 – No response

LEVEL III — (4-5 1 months)

ANTICIPATORY RESPONSES BECOME MORE CONSISTENT

Child begins to recognize the association between specific stimuli and the events that follow; also begins to recognize that he or she can have an effect on people and things in the environment.

Communicative Behaviors

1. Attempts to use at least one signal or action to get an activity to continue or reoccur. Use of signal may be inconsistent at first.
2. Repeats the same signal or continues the movement that has just caused an activity to continue or reoccur, after the other person initiated the first interaction. (Other person may initiate a few more times throughout the session to maintain the interaction.)

Examples of Communicative Cues and Responses

Other person initiates familiar game, "Pat-A-Cake," tickling, etc.	→	Child vocalizes, makes body movement, reaches toward other person.
Music plays, stops.	→	Child smiles, fusses, tries to move toward or touch sound source to "get more music."

Modes of Communication	1. +	1. –	1. 0	2. +	2. –	2. 0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile									
a. Consistently repeats anticipatory response to at least one specific touch cue presented by a familiar person prior to a routine activity							Touch cue for "eat." Touch cue given to have pants changed. (Informational cue) Touch cue given prior to picking up child. (Informational cue)	Opens mouth, leans forward, smiles, turns away. May show no observable response; may quiet or relax; may smile. Might give some body movement to be picked up.	
Objects									
a. Visually directs reach toward preferred objects							Sees or touches bottle.	Reaches	
b. Grasps object placed in hand.							Toy placed in hand.	Grasps and holds.	
c. Repeats action to move an object again (mobile, toy) after accidentally moving it.							Hand accidentally hits a mobile, causing it to move; then it stops.	Tries to reactivate by swatting at it with his/her hand.	
d. Consistently repeats anticipatory responses to a few specific objects associated with a routine activity in a familiar environment.							Sees bib, or bib placed on neck. Sees washcloth, tub. Sees cup or bottle.	Becomes excited, smiles. Becomes excited, fusses. Reaches, opens mouth.	
Gestures and Signs									
a. Attempts to continue the movement during pause in a familiar coactive movement sequence.							Is rocked back and forth, bounced and swung. (Sequence always the same.) Other person pauses while bouncing	Makes some movement to continue the bouncing	
b. Reaches toward familiar person							Other person puts hands out.	Sometimes will extend hands/arms toward other person.	

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Code: + = Accomplished
— = Negative response
0 = No response

LEVEL IV — (5-6+ months)	Communicative Behaviors	Examples of Communicative Cues and Responses	
INTENTIONAL COMMUNICATION DURING FAMILIAR ROUTINES AND IN A FAMILIAR ENVIRONMENT Child begins to initiate interactions; memory for use of signals is developing in familiar environments and in context of familiar routines.	1. Repeats the same signal several times during an interactive session. Other person initiates the first interaction only.	Other person tickles child; stops. →	Child reaches out, grasps person's hand to be tickled again. Child repeats this signal several times.

Modes of Communication	+	—	0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile a. Initiates signal in repertoire to obtain an interaction/action in response to at least one familiar touch cue presented before a routine activity				Touch cue given on arm "to be picked up."	Extends arms. (May do so even if touch cue is not given and adult is nearby.)	
Objects a. Visually directs reach and grasp of objects.				Sees bottle, favorite toy. Music box is playing, stops.	Reaches, grasps. Touches to get it reactivated.	
b. Consistently looks at or touches familiar object to cause its action or reactivation. (Motor impaired child may use any movement.)				An adapted battery-operated toy is moving, lights up, makes noise, stops.	Moves head to activate switch.	
Gestures and Signs a. Continues the movement during pause in a familiar coactive movement sequence. Sequence may now include small motor movements such as clapping.				Is rocked back and forth, bounced, swing. Pause while rocking. Other person plays "Pat-A-Cake" with child (hands over child's). Pauses in middle of sequence.	Child continues the rocking movement. Child continues the clapping.	
b. Gives consistent response to at least one gestural cue presented in a familiar routine and environment.				Other person extends arms out for "up."	Child almost always extends arms to be picked up. (Initiates even when other person has not extended arms.)	

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Code:
+ = Accomplished
− = Negative response
0 = No response

LEVEL V — (6-7+ months)	Communicative Behaviors	Examples of Communicative Cues and Responses
INTENTIONAL COMMUNICATION Child begins to expand the number of signals used to initiate or continue interactions; also begins to understand expectations of others.	1. Repeats signal to reactivate an interaction initiated by another person some moments ago (when other person is present). 2. Uses a second signal if the first does not result in immediate, continued action.	Other person tickles child, then stops. → Child reaches out to grasp person's hand. A few minutes later child repeats above. Child reaches out, grasps person's hand to be tickled again. Person does not respond. → Child fusses, vocalizes.

Modes of Communication	1. +	1. −	1. 0	2. +	2. −	2. 0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile									
a. Gives consistent response to two or more informational touch cues presented in a familiar environment prior to a routine activity.							"Eat." "To be picked up." "To let child know someone is there."	Opens mouth. Extends arms. Quiets.	
b. Uses signals to initiate interaction/action in response to two or more familiar touch cues presented prior to a routine activity.							(See above.)		
Objects									
a. Reaches for an object to indicate "Get it for me," "I want it."							Sees favorite toy or bottle.	Insistently reaches for toy/bottle.	
b. Reaches out, touches, takes or looks at one preferred object to indicate choice. Motor impaired child may choose between two switches to indicate preference.							Cup/stuffed animal shown to child.	Looks toward cup.	
Gestures and Signs									
a. Anticipates and continues the next two or three steps during a pause in a familiar coactive movement sequence.							Other person plays "Pat-A-Cake" with child, stops after first few claps.	Child continues clapping; may try to move hands for part after clapping.	
b. Will participate in a familiar coactive movement sequence simultaneously with other person.							Other person beside or in front of child does "Pat-A-Cake" or other motor sequence.	Child does sequence same time as other person.	
c. Gives consistent response to two or more gestures in a familiar routine and environment.							Other person extends hands for "Up." Other person points to object.	Child extends arms to be picked up. Child looks at object.	

Nonverbal Prelinguistic Communication Sequence
with adaptations for visually impaired, hearing impaired, and deaf-blind

Code: + – Accomplished
– – Negative response
0 – No response

LEVEL VI — (8-12 months)

INTENTIONAL COMMUNICATION GENERALIZES ACROSS SEVERAL ENVIRONMENTS

Child initiates interactions in several environments, including those that are unfamiliar; understands and uses communicative intent out of context of familiar routines and environments. Begins to imitate.

Communicative Behaviors

1. Uses at least two different signals to activate two different activities in several environments.
2. Initiates by using intentional signals in repertoire to repeat an interaction or activity that occurred between 30 minutes and two hours ago. (Other person may have left the area and returned.)

Examples of Communicative Cues and Responses

Child is thirsty.	→	Gives consistent signal to obtain a drink with several people and in several locations, home, school, public place, etc.
Has music box and wants it to play.	→	Will touch music box to get music with several people and in several locations.
Other person sits down and plays with child.	→	Reaches out to grasp adult's hand to be tickled.

Modes of Communication	+	–	0	+	–	0	Examples of Possible Interaction Stimulus	 Response	Description of Actual Interaction
Tactile a. Gives consistent response to two or more touch cues presented out of context. (Unfamiliar environment, different person, familiar activity but at a different time of day.)							Touch cue for "eat" given in unfamiliar environment by different person. Touch cue "to be picked up" by different person.	Opens mouth or turns head away Reaches hands up.	
b. Initiates signals in repertoire to obtain actions/interactions in response to two or more touch cues presented out of context.							Other person touches child to let child know someone is there.	Reaches out to grasp other person's hand to obtain tickling, play interaction.	
c. Touches other person to obtain object, action/interaction							Other person is seated by child, but is not interacting with child.	Child reaches out and touches other person to obtain play or to get attention.	
Objects a. Gives consistent response to at least two familiar objects presented in an unfamiliar environment or out of the usual routine							Cup shown to child in a restaurant. Coat shown to child	Reaches for cup to get drink or pushes it away. Reaches for; shows excitement	
b. Reaches toward, touches or looks at objects to indicate choice between two and four objects.							Cup, cookie, two different toys shown to child.	Reaches, touches or looks at preference.	
Gestures and Signs a. Imitates a two-or-more part sequence of familiar movements following demonstration by familiar person.							Other person demonstrates "Pat-A-Cake," hand clap and rolling hands.	Child claps hands and attempts to roll hands.	
b. Imitates simple action with toys. Actions are in child's repertoire.							Other person hits toy drum.	Child hits toy drum.	
c. Gives object to other person when other person extends hand and looks at child, then at object							Child is holding a sock, other person extends hand.	Child gives sock.	
d. Moves other person's hand to indicate protest or to request more							Cup on table out of child's reach.	Child takes other person's hand and moves toward cup.	

Nonverbal Prelinguistic Communication Sequence

with adaptations for visually impaired, hearing impaired, and deaf-blind

Code:
+ = Accomplished
− = Negative response
0 = No response

LEVEL VII — (12-15 months)

INTENTIONAL COMMUNICATION WITH CONCRETE FORMS OF SYMBOLIZATION

Child understands that concrete symbols can be used to communicate. Establishes relationship between objects and people in order to communicate. Extends memory for symbols/signals. Imitates simple familiar gestures.

Communicative Behaviors

1. Initiates and uses a variety of familiar signals to activate several activities and interactions.
2. Initiates by using intentional signals in repertoire to repeat an action or interaction that occurred more than two hours ago. May initiate with different persons.

Modes of Communication	1. +	1. −	1. 0	2. +	2. −	2. 0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile									
a. Gives consistent response to more than two touch cues presented in and out of familiar context							Touch cue to indicate other person is there. Touch cue for "up." Touch cue for "eat/drink."	Reaches out to touch person. Extends arms. May open mouth, reach out.	
b. Begins to respond to at least one abstract touch cue such as "finished" or a touch cue telling the child that an interaction is finished and the person is leaving							Other person is leaving interaction with child, touches arm to indicate he/she is leaving.	May not show any observable response or may fuss, reach out	
c. Begins to respond to tactile gesture paired with touch cue							Other person provides touch cue for "eat" and has child put his/her hand over other person's hand to "feel" the sign/gesture	May seem unsure at first, but after several repetitions will respond by opening mouth or reaching out, etc., search for food.	
Objects									
a. Relates objects as symbols to represent activities in the schedule of the day							Objects placed in "object shelf" in sequence to represent the order of activities of the day. Child is shown, takes or is given object. (Example: toothbrush)	Takes toothbrush to appropriate area if mobile, may bring to mouth as if to brush teeth.	
b. Relates objects that go together							Cup, sock, spoon on table. Child is shown a pitcher or juice can	Looks at, touches, reaches for cup	
c. Extends an object to other person to obtain an action							Empty cup, bowl on table, tray	Extends cup, bowl to obtain juice, food	
Gestures and Signs									
a. Gives consistent response to at least two different gestures presented in an unfamiliar environment or in a different routine.							Gesture for "up" by unfamiliar person Gesture for "come here" in an unfamiliar place.	Reaches up or may fuss. Reaches toward, moves toward	
b. Looks at person, object or activity when adult points							Adult points to music box (after obtaining child's attention).	Looks toward music box.	
c. Looks at object, other person, then extends hand to obtain an object that is in view							Cup on table, out of reach, but in view.	Looks at cup and other person and extends hand	
d. Gives object to other person when that person points to object, looks at child and gestures, "Give me."							Child is holding a sock/shoe	Other person points to shoe, looks at child and gestures, "Give me." (May be extended hand gesture.)	

Nonverbal Prelinguistic Communication Sequence
with adaptations for visually impaired, hearing impaired, and deaf-blind

Code: + – Accomplished
− – Negative response
0 – No response

LEVEL VIII — (15-18 months)	Communicative Behaviors	Examples of Communicative Cues and Responses	
INTENTIONAL COMMUNICATION WITH GESTURES Understands abstract symbols as communicators. Initiates approximation of unfamiliar gestures. Consistently initiates familiar gestures and other signals in repertoire to communicate.	1. Initiates and uses an increased number and variety of signals for interactions with others and objects.		
	2. Initiates by using signals in repertoire to repeat an action or interaction that occurred one or more days ago. May initiate with several people.	The day before child had pulled other person's hand to music box to get the music turned on. →	Child repeats this interaction the following day. (Memory for signal.)

Modes of Communication	+	−	0	+	−	0	Examples of Possible Interaction: Stimulus	Response	Description of Actual Interaction
Tactile									
a. Gives consistent response to two or more tactile gestures/signs (abstract touch cues) presented in context.							Other person provides gesture/sign for eat. Child feels sign by putting hand over other person's. Child is in high chair or at table, has bib on, etc. Same procedure: gesture for music, touch on ear.	May reach out, open mouth, search for food. Searches for music box or other anticipatory behavior.	
b. Touches or takes other person's hands in order to get person to communicate (sign).							Child wants other person to "talk" (sign) to him/her	Reaches out to take other person's hands.	
c. Initiates signals in repertoire to obtain action/interaction in response to at least one abstract touch cue, tactile gesture, tactile sign.							Child is given touch cue to indicate other person is there.	May give signal that he/she wants to be played with, to eat, to be picked up, etc.	
Objects									
a. Begins to relate pictures as symbols paired with objects to represent activities in the schedule of the day.							Objects and drawn pictures placed in object shelf in sequence. Child is shown object and picture, is given picture of cup.	Child takes picture of cup to eating area.	
Gestures and Signs									
a. Imitates unfamiliar gestures.							Other person puts arms out or shakes head, etc.	Child imitates.	
b. Points to object and looks at other person to obtain object.							Toy in view, out of reach.	Points to toy and looks at person. (May vocalize.)	
c. Uses at least five gestures.							Other person in vicinity.	Hands up, extends hand, points, touches mouth (eat), tugs on other person, etc.	
d. Responds consistently to a few formal signs and/or voice paired with familiar gestures							Gestures "up," paired with manual sign	Child raises hands up.	
e. Gives object upon gesture/verbal cue even though object is not part of an interaction							Other person gestures "Give me" and points to a toy that is not being used.	Child retrieves toy, gives to adult.	

Nonverbal Prelinguistic Communication Sequence
with adaptations for visually impaired, hearing impaired, and deaf-blind

Code:
+ – Accomplished
− – Negative response
0 – No response

LEVEL IX — (18-24 months)

INTENTIONAL COMMUNICATION WITH ABSTRACT SYMBOLS

Begins to use abstract symbols to communicate when concrete symbols and other environmental cues are absent. Imitation provides a means for the child to acquire/confirm new sign/voice symbols for communication.

Communicative Behaviors

1. Initiates or continues interaction by imitating new abstract symbols.
2. Initiates interaction by using a few familiar abstract symbols in repertoire when objects or picture symbols are not present.

Modes of Communication	1. +	1. −	1. 0	2. +	2. −	2. 0	Examples of Possible Interaction: Stimulus	Examples of Possible Interaction: Response	Description of Actual Interaction
Tactile									
a. Gives consistent response to more than two tactile gestures/signs presented out of familiar context							Given tactile sign for cookie away from table area.	May imitate sign to indicate "want cookie," extends hand.	
b. Initiates more than two tactile gestures/signs in familiar context.							Given tactile sign for shoe. (Child has previously responded to signs paired with actual objects.)	May imitate sign and reach for shoe	
Objects									
a. Begins to relate pictures as symbols to represent activities in the schedule of the day.							Drawn picture placed on wall chart in sequence of the day's activities. Child is taken to picture of shoe	Child takes picture of shoe to P.E. area.	
b. Begins to relate tactile representation as symbols to represent familiar objects							Tactile symbols for play (thermoformed).	Takes thermoformed symbol to play area.	
c. Touches, takes, points to, or looks at picture to indicate choice when two or more familiar pictures are presented							Is shown picture of cup, toy.	Child touches, points, takes or looks at cup to indicate "want drink."	
Gestures and Signs									
a. Initiates signs or voice to obtain an action or interaction and to receive confirmation							Asked, "What do you want?", gives cookie sign.	Imitates the sign for cookie, extends hand to obtain cookie	
b. Responds (signs/voice) to single familiar concept in context when objects or picture symbols are not present							Sign given for "cookie." Sign given for "work."	Looks for cookie, imitates sign, etc. Goes to "work" area.	
c. Uses at least two familiar signs/words/gestures that represent an action when object or person is present							Other person is in vicinity. Sees cookie.	Gestures "up," signs "eat." Signs "cookie."	

NAME: ____________________

NONVERBAL PRELINGUISTIC SEQUENCE
RESPONSE SUMMARY

MODES OF COMMUNICATION	LEVELS								
	I	II	III	IV	V	VI	VII	VIII	IX
1. TACTILE	a b c	a	a	a	a b	a b c	a b c	a b c	a b
2. OBJECTS	a b	a b c	a b c d	a b	a b	a b	a b c	a	a b c
3. GESTURES AND SIGNS	a b	a b	a b	a b	a b c	a b c d	a b c d	a b c d e	a b c

Suggested Instructions: Color code each item accomplished by using a different color on each testing date to record amount and rate of progress. It may be helpful to circle items targeted for instruction and write in the objective for use as a guide in planning the child's communication program.

COMMUNICATION GOALS TARGETED FOR INSTRUCTION:

Date: ____________ Level: Mode:

Date: ____________ Level: Mode:

Date: ____________ Level: Mode:

Date: ____________ Level: Mode:

LEVELS OF PRELINGUISTIC COMMUNICATION

LEVELS	COMMUNICATIVE BEHAVIOR*	MODES OF COMMUNICATION		
		Tactile*	Objects*	Gestures and Signs*
I. REACTIVE/ REFLEXIVE RESPONSES Nonintentional Communication Child's attention or response to stimulation may communicate pleasure sensations, likes, dislikes, "wants" to another person. 0-1 month	1. Gives any response to at least one stimulus or combination of stimuli. Responses may be inconsistent. 2. Repeats the same response to repeated presentations of the same stimulus when the conditions are the same. 3. Repeats the same response to a number of different stimuli (response may be generalized to more than one stimulus). 4. Gives at least two different responses to the same stimulus. (The stimulus creates generalized responding.)	a. Reacts to touch, may startle. b. When approached and touched gently accompanied by a soothing voice, child attends and does not startle. c. Reacts to touch cues paired with environmental cues.	a. Quiets, fixates or shows excitement on sight of or contact with motivational object. b. Gives some type of response to at least one familiar object paired with environmental cues.	a. Allows other person to move child through whole body movements that are in the child's repertoire (Movements are in sequence.). b. Quiets, fixates or shows excitement on seeing care-giver or familiar person.
II. NONSPECIFIC ANTICIPATORY RESPONSES Nonintentional Communication Child begins to anticipate that a familiar action/ interaction will occur following specific stimuli. 2-3+ months	1. Gives some type of anticipatory response to at least one stimulus associated with a specific routine or with familiar stimuli in the environment. (Response may be a continuation of a movement.)	a. Gives some type of anticipatory response to at least one specific touch cue paired with specific environmental cues when presented by a familiar person prior to a routine activity.	a. Gives an anticipatory response to at least one familiar object paired with other environmental cues. b. Shifts visual attention between objects. c. Accidentally moves object with body.	a. Makes any anticipatory movement or reaction during pause in a familiar "whole body" coactive movement sequence. b. Attends/alerts to familiar gestures made by other person.
III. ANTICIPATORY RESPONSES BECOME MORE CONSISTENT Child begins to recognize the association between specific stimuli and the events that follow, also begins to recognize that he or she can have an effect on people and things in the environment 4-5+ months	1. Attempts to use at least one signal or action to get an activity to continue or reoccur. Use of signal may be inconsistent at first. 2. Repeats the same signal or continues the movement that has just caused an activity to continue or reoccur after the other person initiated the first interaction. (Other person may initiate a few more times throughout the session to maintain the interaction.)	a. Consistently repeats anticipatory response to at least one specific touch cue presented by a familiar person prior to a routine activity.	a. Visually directs reach toward preferred objects. b. Grasps object placed in hand. c. Repeats action to move an object again (mobile, toy) after accidentally moving it. d. Consistently repeats anticipatory responses to a few specific objects associated with a routine activity in a familiar environment.	a. Attempts to continue the movement during pause in a familiar coactive movement sequence. b. Reaches toward familiar person.

* Signals used to request "more," continuation or initiation of an interaction; to stop or to discontinue an activity

* Touch cues/tactile signs.

* Includes calendar and active stimulation programming.

* Gestures/visual signs (includes coactive movement).

LEVELS OF PRELINGUISTIC COMMUNICATION

LEVELS	COMMUNICATIVE BEHAVIOR*	MODES OF COMMUNICATION		
		Tactile*	Objects*	Gestures and Signs*
IV. INTENTIONAL COMMUNICATION DURING FAMILIAR ROUTINES AND IN A FAMILIAR ENVIRONMENT Child begins to initiate interactions; memory for use of signals is developing in familiar environments and in context of familiar routines. 5-6+ months	1. Repeats the same signal several times during an interactive session. Other person initiates the first interaction only.	a. Initiates signal in repertoire to obtain an interaction/action in response to at least one familiar touch cue presented before a routine activity.	a. Visually directs reach and grasp of objects. b. Consistently looks at or touches familiar object to cause its action or reactivation. (Motor-impaired child may use any movement to activate a switch.)	a. Continues the movement during pause in a familiar coactive movement sequence. Sequence may now include small motor movement such as clapping. b. Gives consistent response to at least one gestural cue presented in a familiar routine and environment.
V. INTENTIONAL COMMUNICATION Child begins to expand the number of signals used to initiate or continue interactions; also begins to understand expectations of others. 6-7+ months	1. Repeats signal to reactivate an interaction initiated by another person some moments ago (when other person is present). 2. Uses a second signal if the first does not result in immediate, continued action.	a. Gives consistent response to two or more informational touch cues presented in a familiar environment prior to a routine activity. b. Uses signals to initiate interaction/action in response to two or more familiar touch cues presented prior to a routine activity.	a. Reaches for an object to indicate "Get it for me", "I want it." b. Reaches out, touches, takes or looks at one preferred object to indicate choice. Motor impaired child may choose between two switches to indicate preference.	a. Anticipates and continues the next two or three steps during a pause in a familiar coactive movement sequence. b. Will participate in a familiar coactive movement sequence simultaneously with other person. c. Gives consistent response to two or more gestures in a familiar routine and environment.
VI. INTENTIONAL COMMUNICATION GENERALIZES ACROSS SEVERAL ENVIRONMENTS Child initiates interactions in several environments including those that are unfamiliar; understands and uses communicative intent out of context of familiar routines and environments. Begins to imitate. 8-12 months	1. Uses at least two different signals to activate two different activities in several environments. 2. Initiates by using intentional signals in repertoire to repeat an interaction or activity that occurred between 30 minutes to two hours ago. (Other person may have left the area and returned.)	a. Gives consistent response to two or more touch cues presented out of context. (Unfamiliar environment, different person, familiar activity but at a different time of day.) b. Initiates signals in repertoire to obtain action/interactions in response to two or more touch cues presented out of context. c. Touches other person to obtain object, action, interaction.	a. Gives consistent response to at least two familiar objects presented in an unfamiliar environment or out of the usual routine. b. Reaches toward, touches or looks at objects to indicate choice between two and four objects.	a. Imitates a two-or-more-part sequence of familiar movements following demonstration by familiar person. b. Imitates simple action with toys. Actions are in child's repertoire. c. Gives object to other person when other person extends hand and looks at child, then at object. d. Moves other person's hand to indicate protest or to request more.

* Signals used to request "more," continuation or initiation of an interaction; to stop or to discontinue an activity.

* Touch cues/tactile signs.

* Includes calendar and active stimulation programming.

* Gesture al signs (includes coactive ment).

LEVELS OF PRELINGUISTIC COMMUNICATION

LEVELS	COMMUNICATIVE BEHAVIOR*	MODES OF COMMUNICATION		
		Tactile*	Objects*	Gestures and Signs*
VII. INTENTIONAL COMMUNICATION WITH CONCRETE FORMS OF SYMBOLIZATION Child understands that concrete symbols can be used to communicate. Establishes a relationship between objects and people in order to communicate. Extends memory for symbols/signals. Imitates simple, familiar gestures. 12-15 months	1. Initiates and uses a variety of familiar signals to activate several activities and interactions. 2. Initiates by using intentional signals in repertoire to repeat an action or interaction that occurred more than two hours ago. May initiate with different persons.	a. Gives consistent response to more than two touch cues presented in and out of familiar context. b. Begins to respond to at least one abstract touch cue such as "finished" or a touch cue telling the child that an interaction is finished and the person is leaving. c. Begins to respond to tactile gesture paired with touch cue.	a. Relates objects as symbols to represent activities in the schedule of the day. b. Relates objects that go together. c. Extends an object to other person to obtain an action.	a. Gives consistent response to at least two different gestures presented in an unfamiliar environment or in a different routine. b. Looks at person, object or activity when adult points. c. Looks at object, other person, then extends hand to obtain an object that is in view. d. Gives object to other person when that person points to object, looks at child and gestures 'Give me.'
VIII. INTENTIONAL COMMUNICATION WITH GESTURES Understands abstract symbols as communicators. Imitates approximation of unfamiliar gestures. Consistently imitates familiar gestures and other signals in repertoire to communicate. 15-18 months	1. Initiates and uses an increased number and variety of signals for interactions with others and objects. 2. Initiates by using signals in repertoire to repeat an action or interaction that occurred one or more days ago. May initiate with several people.	a. Gives consistent response to two or more tactile gestures/signs (abstract touch cues) presented in context. b. Touches or takes other person's hands in order to get person to communicate (sign). c. Initiates signals in repertoire to obtain action/interaction in response to at least one abstract touch cue, tactile gesture, tactile sign.	a. Begins to relate pictures as symbols paired with objects to represent activities in the schedule of the day.	a. Imitates unfamiliar gestures. b. Points to object and looks at other person to obtain object. c. Uses at least five gestures. d. Responds consistently to a few formal signs and/or voice paired with familiar gestures. e. Gives object upon gesture/verbal cue even though object is not part of an interaction.
IX. INTENTIONAL COMMUNICATION WITH ABSTRACT SYMBOLS Begins to use abstract symbols to communicate when concrete symbols and other environmental cues are absent. Imitation provides a means for the child to acquire/confirm new sign/voice symbols for communication. 18-24 months	1. Initiates or continues interaction by imitating new abstract symbols. 2. Initiates interaction by using a few familiar abstract symbols in repertoire when objects or picture symbols are not present.	a. Gives consistent response to more than two tactile gestures/signs presented out of familiar context. b. Initiates more than two tactile gestures/signs in familiar context.	a. Begins to relate pictures as symbols to represent activities in the schedule of the day. b. Begins to relate tactile representation as symbols to represent familiar objects. c. Touches, takes, points to, or looks at picture to indicate choice when two or more familiar pictures are presented.	a. Imitates signs or voice to obtain an action or interaction and to receive confirmation. b. Responds (signs/voice) to single familiar concept in context when objects or picture symbols are not present. c. Uses at least two familiar signs/words/gestures that represent an action when object or person is present.

* Signals used to request "more," continuation or initiation of an interaction, to stop or to discontinue an activity

* Touch cues/tactile signs.

* Includes calendar and active stimulation programming

* Gestures/visual signs (includes coactive movement)

References

* Indicates reference is available in the Deaf-Blind Resource Library

*Anderson, Sharon, "Where Do I Start — Some Ideas for Beginning Communications with Pre-language Children". *The Deaf-Blind/Severely Profoundly Handicapped Child*, Nebraska Department of Education, 1978.

Bates, Elizabeth, Benigni, L., Brotherton I., Camaioni, L and Volterra, V., "From Gesture to the First Word: On Cognitive and Social Prerequisites", in M. Lewis and L Rosenblum (Eds.), *Interation, conversation and the development of language*, New York: John Wiley and Sons, 1977.

Dunst, Carl T., *A Clinical and Educational Manual for Use with the Uzgiris and Hunt Scales of Infant Psychological Development*, University Park Press, Baltimore, Maryland 21202.

*Feiber, Nancy, "The Profoundly Handicapped Child — Assessing Sensorimotor and Communication Abilities", Omaha, Nebraska, Myers Rehabilitation Institute.

*Feiber, Nancy and Robinson, Cordelia, "Development and Modification of Piagetian Sensorimotor Assessment and Curriculum for Developmental Handicapped Infants", Omaha, Nebraska, Myers Rehabilitation Institute.

*Freeman, Peggy, Understanding the Deaf-Blind Child. Heinemann, Health Books, London, 1975.

Johnson, Jens and Altermeier, Carolina Curriculum for Handicapped Infants, 1979.

*Jones, Tom W., "Manual for Language Development", Mid-Atlantic-Caribbean Regional Center, 1975.

*McInnes, J. M. and Treffry, J. A., *Deaf-Blind Infants and Children*, University of Toronto Press, 1982.

*Nixon, Roberta R., Pre-language Sensorimotor Stimulation/Integration Program for the Development of Cognition and Communication, Portland Public Schools, Providence Child Center, 1977.

Piaget, Jean, *The Origins of Intelligence in Children*, New York: Universities Press, Inc., 1974.

*Robinson, Penney, "An Educational Approach Utilizing Developmental Sequencing and the Co-active Movement Theory".

*Silverrain, Ann, "The Use of 'Symbol Shelves' in Teaching Communication with Multi-handicapped Children, Education Service Center, Region 20, San Antonio, Texas, 1982.

*Smith, Nelson F., "Learned Helplessness", *Technical Newsletter No. 5*, Educational Technology Center, Inc., Foster, Rhode Island, 1973.

*Sternberg, Les, Battle, Christy, Hill, Janet, "Prelanguage Communication Programming for the Severely and Profoundly Handicapped". Journal of Association Severely Handicapped, 1980, 5(3), p. 224-233.

*Stillman, Robert (Ed), *The Callier-Azuza Scale*, The University of Texas at Dallas, Callier Center for Communication Disorders, 1978.

*Umholtz, Robbie, Rudin, Dale, "Teaching Time Concepts Through the Use of Concrete Calendars", Texas School for the Blind, Deaf-Blind Annex, Austin, Texas, 1981.

*Van Dijk, J., The first steps of the deaf-blind child toward language, Proceedings of the Conference on the Deaf/Blind, Refsnis, Denmark, Boston: Perkins School for the Blind, 1965.

JASH
1984, Vol. 9, No. 3, 201-212

copyright 1984 by
The Association for Persons with Severe Handicaps

Analyzing the Communicative Functions of Aberrant Behavior[1]

Anne M. Donnellan, Patricia L. Mirenda, Richard A. Mesaros and Lynette L. Fassbender.

Author Information

Anne M. Donnellan, Ph.D., Assistant Professor, University of Wisconsin-Madison.

Patricia L. Mirenda, Ph.D., Assistant Professor, University of Nebraska-Lincoln.

Richard A. Mesaros, Ph.D., Adjunct Professor, California State University-Northridge.

Lynette L. Fassbender, M.S., Doctoral Student, University of Wisconsin-Madison.

Article Descriptors

behavior management; severely handicapped; pragmatics; functional analysis; communication; antecedent management; functions of behavior; non-aversive; assessment

This paper presents some issues related to the assessment of possible communicative functions of aberrant behavior. These issues are addressed in terms of both the behavioral and the pragmatics literature, with the suggestion that the latter can be drawn upon to support and enhance the information derived from traditional functional analyses of behavior. Included are an assessment strategy and tool that can be used to formulate and test hypotheses about functions of behavior.

Considerable research attention has been focused on designing interventions to reduce aberrant behavior in severely handicapped individuals. While there are many examples in the literature of successful interventions in this regard (e.g., Dietz, Repp, & Dietz, 1976; Lovaas, Schaeffer, & Simmons, 1965), there are reports of treatment failures as well (e.g., Corte, Wolf, & Locke, 1971; Solnick, Rincover, & Peterson, 1977). It has been suggested that such failures may be related to the selection of intervention procedures prior to an adequate analysis of the motivational sources of target behaviors (Gardner & Cole, 1983; LaVigna & Donnellan, in press; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). Without the benefit of such an analysis, interventions are often selected arbitrarily, rather than as they relate to the antecedent and consequential events that directly support the behaviors of concern. In addition, even when interventions are individually selected on the basis of functional analyses, there may be procedural variables which mitigate against their long-term effectiveness. Some authors have suggested that one such variable may be the failure to insure that behavioral suppression will be maintained by "naturally occurring contingencies of reinforcement" (Stokes & Baer, 1977).

One way of insuring the application of natural contingencies involves teaching new, functional behaviors that result in reinforcing consequences similar to those available following the aberrant behaviors. For example, Horner and Budd (1983) determined that the grabbing and yelling behaviors of an 11-year-old boy with severe retardation were associated with five specific stimulus conditions, all of which involved desired foods or objects. They systematically taught the child to perform the manual sign label for each of the desired items, and reported a concomitant reduction in grabbing and yelling as the child began to use the signs spontaneously to obtain the items. They suggested that the effectiveness of the procedure may have been related to the close similarity between the reinforcement that was naturally available to their subjects through use of manual signs and the reinforcement that was previously available through grabbing and yelling (i.e., the child obtained the desired objects). Other authors have also noted similar covariation between inappropriate responses and functionally related substitute behaviors (e.g., Eason, White, & Newsom, 1982).

A Pragmatic View of Aberrant Behavior

The literature concerned with the study of the communicative functions of language or "pragmatics" (Bates, 1976) may help shed some light on the success of functionally related interventions such as the one described by Horner and Budd (1983). Pragmatics is the study of language within the social context, and emphasizes the use of verbal and nonverbal language as a social tool (Schuler & Goetz, 1981). From a pragmatics perspective, all behavior is considered to be communicative, as noted by Watzlawick, Beavin, and Jackson (1967):

> No matter how one may try, one cannot *not* communicate. Activity or inactivity, words or silence all have message value: they influence others and these others, in turn, cannot *not* respond to these communications and are thus themselves communicating. It should be clearly understood that the mere absence of talking or of taking notice of each other is no exception to what has just been asserted (p. 49).

Thus, the basic premise of a pragmatic approach is that all behavior, regardless of topography, has functional message value (Schuler & Goetz, 1981). This is not unlike the behaviorist assertion that all behavior can be traced to its motivational source and is a product of both antecedent and consequential stimuli (Carr, 1977). The inferred "message" assigned to behavior from a pragmatics perspective is analogous to the "motivational dynamics" revealed by a functional analysis.For example, Lovaas et al. (1965) found that the self-injurious behavior observed in their subjects was motivated by contingent social attention; in pragmatic terms, the self-injurious behavior delivered the message "Pay attention to me!". Similarly, Carr, Newsom, and Binkhoff (1980) determined that their subjects' aggressive behavior was motivated primarily by escape factors (negative reinforcement); the message that can be inferred from such aggression is "Leave me alone! I don't want to do this!".

It is important to note that it is the functional relationship between behavior and context, rather than the topography of behavior alone that is indicative of its motivational source or communicative intent. For example, in observing a stranger tap her foot, one would need some contextual information in order to tell if she was waiting impatiently for someone, if she was keeping time to a tune in her head, or if she merely had an itchy foot. Schuler and Goetz (1981) outlined a number of the communicative functions of both aberrant and appropriate behaviors. They noted that, for an individual person, some communicative means may be function-specific (i.e., they are used to communicate only one message), while others may serve a variety of functions. This observation was borne out by Iwata et al. (1982) who found that, in six of the nine severely handicapped subjects they studied, self-injuriou behavior was consistently associated with a specifi stimulus condition, though this varied across subjects For the other three subjects, self-injury apparentl served multiple functions, including sensory stimulation, producing attention from others, and terminatin undesirable situations. From a pragmatics perspective the self-injury exhibited by these subjects conveye three different messages, depending on the context "I'm bored" (sensory stimulation); "Pay attenton t me" and "I don't want to do this anymore."

Pragmatically Oriented Interventions

Several researchers in recent years have explore the efficacy of behavioral interventions based on pragmatic perspective (e.g., Carr, 1981; Gaylord Ross, 1980). The advantage of such a perspective lie in its educational (Voeltz & Evans, 1983), socia (Wolf, 1978), and ecological validity (Rogers-Warre & Warren, 1977). There is a growing awarenes among educators that the long-term successful functioning of persons with severe handicaps depends o expanding their limited response repertoires rather tha simply eliminating their inappropriate behaviors. I terventions designed to teach functionally relate behaviors in place of aberrant responses make goo educational sense in this regard. Further, such an proach explicitly acknowledges the functio legitimacy of even aberrant behavior and, in so doin communicates a respectful attitude concerning the individual exhibiting the behavior. Finally, pragmatic interventions are likely to involve teaching alternati behaviors maintained by naturally available reinforcers, resulting in good generalization an maintenance.

Three types of pragmatically oriented interventio will be discussed in this section: (a) those designed teach new communicative behaviors to replace aberrant responses; (b) those designed to teach other functionally related behaviors to replace aberrant response and (c) those involving antecedent manipulations. A example of each type of intervention will also be provided. Though the examples are actual cases, intervention data are not available.

Teaching Alternative Communicative Behaviors

For several years, researchers interested in communication training with severely handicapped individuals have noted an inverse (and usually unplanne relationship between aberrant behavior and an individual's ability to use some type of verbal or gestur communication system (e.g., Carr, 1979; Lovaa Berberich, Perloff, & Schaeffer, 1966). There ha also been several reports of successful interventio aimed at teaching communication behaviors for the explicit purpose of reducing aberrant behavior (Carr al., 1980; Durand, 1982; Horner & Budd, 1983). Such interventions can be considered pragmatically based in that they are designed around the functional message value of the aberrant response. Thus, one communicative behavior (e.g., a manual sign to elicit attention) simply replaces another (e.g., a tantrum maintained by social attention).

The success of such interventions can be explained by several related factors. Carr et al. (1980) and Durand (1982) explained it in terms of response competition and suggested that, as appropriate communicative responses are reinforced and strengthened, they become more efficient than the aberrant responses at eliciting the desired reinforcers. Therefore, the aberrant responses are gradually decreased in frequency as their functional properties are transferred to the new, appropriate behavior. In addition, the appropriate communicative behavior results in access to the same naturally available reinforcers that were formerly obtained through aberrant behaviors; these include both positively (e.g., food, objects; Horner & Budd, 1983) and negatively reinforcing consequences (e.g., escape from demands; Carr et al., 1980).

Example: Don is an 18-year-old man with severe mental retardation. His formal communicative abilities are limited to approximately 15 signs which he rarely uses spontaneously. His major presenting behavioral problem was low rate but severe self-injurious behavior in the form of head-banging, head-punching and face-slapping. In an attempt to decrease or eliminate the self-injury, various intervention procedures had been instituted in the past, but none were effective long-term. These included extinction; differential reinforcement of other behavior (DRO), and overcorrection programs.

A functional analysis of the behavior revealed that Don's self-injury was apparently being maintained by positive reinforcement. That is, Don's teacher usually provided social attention in the form of assistance with the ongoing activity whenever self-injury occurred. In pragmatic terms, the message conveyed by the self-injury seemed to be "Pay attention to me, I need help." On the basis of this analysis, a decision was made to teach Don an alternative means of communicating his need for assistance when working independently and confronting a problem.

A combination of prompting/fading and modelling was used to teach Don to ask for assistance whenever he encountered task difficulty. There were three components to the request sequence: (1) eliciting the teacher's attention: get up from the chair, visually scan the classroom to locate an instructor, walk to the instructor, and tap him on the shoulder; (2) requesting assistance: make the manual sign for "help"; and (3) specifying the kind of help needed: walk back to the work area and point to the task at hand. Numerous opportunities for practice were engineered across the school day by providing Don with a number of difficult tasks and physically prompting him through the entire sequence at the initial signs of self-injurious behavior (usually agitation and loud vocalizations). Whenever possible, Don was also physically prompted through the sequence when self-injury occurred outside of these instructional sessions; if this was not possible, brief physical restraint was applied to prevent Don from hurting himself. The prompts were systematically faded as Don began to use the "help" sign in place of self-injury and to perform the sequence spontaneously. Within six weeks, Don regularly performed the request-for-assistance sequence whenever he encountered task difficulty, and the self-injurious behavior was virtually eliminated.

Teaching Other Functionally Related Alternative Responses

Some types of interventions involving the differential reinforcement of alternative responses (Alt-R; see LaVigna & Donnellan, in press, for a review) can also be considered to be pragmatically based strategies. Specifically, these include the subset of Alt-R interventions that involve direct instruction of an alternative behavior which serves the same function as the aberrant response (e.g., Eason et al., 1982). Generally, this means that the alternative behavior results in reinforcement that is topographically and functionally similar to that available following the undesired behavior. Since this approach does not involve teaching an alternative response that is specifically communicative (e.g., a manual or gestural sign), it differs from the approach used by Carr et al. (1980) and others. However, such Alt-R interventions acknowledge the message value of an aberrant response (e.g., "Pay attention to me") by systematically providing the requested reinforcer (e.g., attention) following appropriate, alternative behaviors. The result is that the alternative response replaces the target behavior, which decreases over time.

Example: Sam is a 12-year-old boy with autism and moderate retardation. He has a fairly extensive sign repertoire which he can use spontaneously. When Sam was in situations that were noisy, crowded, and/or novel, he exhibited many high rate self-stimulatory behaviors that were primarily auditory in nature, e.g., finger snapping and loud, piercing, repetitive vocalizations. He engaged in these behaviors to the extent that his family and teachers refrained from taking him into community settings such as shopping malls, stores, and recreational facilities, since such environments seemed to trigger the disruptive behaviors. Several interventions including overcorrection and DRO programs had been attempted with varying degrees of success in the past.

A functional analysis indicated that Sam's self-stimulation seemed to be related to arousal reduction.

That is, Sam seemed to exhibit the behaviors in order to screen out the high levels of sensory input available in novel, stimulating environments. The behaviors were interpreted pragmatically to mean: "I'm anxious/tense/excited/overwhelmed by the input available."

A decision was made to provide direct instruction aimed at teaching Sam an alternative, appropriate behavior that could serve the same function, so that he could begin to participate in community-based activities. The intervention was conducted in two phases. First, Sam was provided with a portable stereo headset and cassette tape player during brief community excursions. He was taught to operate the cassette player and was reinforced for wearing the system and listening to soothing music when he was in environments that usually triggered self-stimulation. Thus, Sam was taught an alternative way to screen out excess environmental input. Within a few weeks, he was able to participate in community activities with virtually no self-stimulatory noisemaking, as long as he wore the portable tape system. During phase two, which extended over a period of three months, the tape system was provided to Sam in the community after increasingly longer periods of time during which no self-stimulatory noises occurred. Eventually, Sam was able to tolerate exposure to novel environments for up to one hour at a time before using the tape set for a 10-minute period. This allowed his teachers to provide critical community-based instruction and at the same time acknowledged his need for intermittent sensory respite that was previously communicated through self-stimulation.

Antecedent Interventions

Finally, the success of interventions that involve the manipulation of antecedent conditions to decrease aberrant behavior (e.g., Gaylord-Ross, 1980) can also be easily understood in the context of pragmatics. To view all behavior as communicative is to legitimize the behavior as having message value in the context in which it occurs. Behavior is thus regarded as a commentary on context; as contextual or antecedent conditions change, the behavior may also vary in rate or intensity. Consider, for example, behavior that is apparently motivated by escape factors, or, in pragmatic terms, that communicates the message "I don't want to do this anymore." If one assumes that such a message is legitimate, one would have to ask the question, "Why would someone want to escape from this situation?", and then proceed to look at antecedent conditions to find the answer. This type of antecedent analysis was reported by Weeks and Gaylord-Ross (1980), who found that the frequency of escape-motivated behavior in their three subjects was related to the difficulty level of tasks. Antecedent manipulations that involved simplifying the tasks, decreasing the frequency of demands, and using errorless learning procedures all contributed to a decrease in the aberrant responses. Similarly, Carr, Newsom, and Binkhoff (1976) and Gaylord-Ross, Weeks, and Lipner (1980) found that escape-motivated behavior covaried with the frequency and form of instructional directives delivered to their subjects. Such antecedent approaches are proactive in that they treat aberrant behavior as legitimate feedback that can be utilized to make curricular and ecological modifications to enhance the fit between the handicapped individual and his/her environment.

Example: Sarah is a 7-year-old girl with autism and severe retardation. She is able to communicate verbally, though much of her speech is stereotyped and echolalic. Her major presenting problems were aggression to staff members and severe tantrumming, including throwing objects in the classroom. Previous interventions included physical restraint and time-out but these were not successful in decreasing the behaviors.

The problem behaviors were exhibited during three particular periods of the school day, all of which involved structured work tasks. A functional analysis indicated that the behaviors were maintained primarily by negative reinforcement; that is, whenever aggression or tantrums occurred, either the activity was terminated or Sarah was removed from the activity by an aide. The communicative messaged conveyed was "I don't understand; I don't want to do this," and it was hypothesized that this message was related to task difficulty and lack of interest in the task.

A decision was made to manipulate several antecedent variables to alter the frequency of the problem behavior. First, Sarah was assessed more carefully to determine her learning strengths, weaknesses, and modality preferences. Because this assessment revealed that Sarah had difficulty in receptive language comprehension, her teacher began to use primarily physical prompting/fading techniques rather than verbal strategies for instruction. Additionally, the instructional language that was used was simplified so that it would be more comprehensible to Sarah. The staff also began to use errorless learning strategies and individualized reinforcement techniques.

Secondly, the tasks and activities were re-evaluated for motivational value and functionality. Several tasks were changed on the basis of this evaluation, and those that remained in Sarah's program were modified through the use of instructional adaptations (Baumgart et al., 1982) to facilitate skill acquisition. Finally, the length of instructional sessions was shortened and the sessions were interspersed with brief break periods.

These antecedent manipulations were designed to provide instruction geared to Sarah's learning style and strengths, and to provide the necessary motivation. The program was designed to acknowledge the legitimacy of the communicative message of Sarah's behavior ("I don't understand"), and her aggression and tantrum behaviors decreased as they became unnecessary for terminating the activity.

Assessing the Communicative Functions of Behavior

In order to design pragmatic interventions based on the premise that behavior is communicative, it is important to accurately identify the motivational messages conveyed by behavior. A few such messages have already been discussed; for example, "Pay attention to me" is one message conveyed by behavior motivated by positive reinforcement in the form of social attention. Table 1 displays some of the communicative messages that can be inferred from behaviors motivated by a number of factors, as discussed by Carr (1977) and Romanczyk, Kistner, and Shakelford (1982).

Representative examples from the intervention literature are also referenced in Table 1 when appropriate. Such examples are listed in three categories: (a) interventions that involve teaching new, communicative behaviors to replace the aberrant responses; (b) interventions that involve teaching other functionally related alternative responses; and (c) interventions that involve manipulating antecedent conditions. The bracketed interventions have not been documented empirically, and are included as suggestions for future research efforts.

In addition, Figure 1 provides the flow chart of a simple assessment strategy developed to assist parents, educators, and clinicians to form hypotheses regarding the communicative functions of various behaviors. The strategy was developed by a task force composed of researchers, parents, educators, and speech-language clinicians involved with severely handicapped individuals (Mirenda et al., 1983). There are three main components to the strategy:

> **1) identify the behaviors or communicative functions that are of primary interest;**
> **2) form one or more hypotheses regarding function-behavior relationships.** Such hypothesis-formation requires extensive observation of the student and consideration of a host of contextual variables, as outlined in Figure 1.

In order to assist practitioners in forming function/behavior hypotheses, an observational tool that lists a variety of behaviors and communicative functions is presented in Figure 2. This tool is similar to the Communicative Interview form developed by Peck, Schuler, and Semmel (1983) and is intended to be used as an observational data collection instrument. A number of behaviors are listed across the top of the tool[2], and a listing of possible functions is provided on the left. The functional categories were derived from several taxonomies of the pragmatic uses of language by non-handicapped children (see Chapman, 1981), and definitions of the functions are provided in Table 2.

The tool can be used by the practitioner to record ongoing impressions regarding the possible communicative function(s) of the behavior(s) of interest. In order to form such impressions, the practitioner asks the question, "In the present context, what does the student seem to be communicating and how does he or she do so?" The observation tool is used to match possible functions and behaviors by moving across or down the page and noting the point(s) of intersection.

> **3) based on these observations, temporarily alter either the antecedent or the consequential events supporting the behavior, in order to test the hypotheses.** In effect, this means that a brief, data-based intervention probe is instituted in order to gather more information about the hypothesized functions of the behavior. Accurate measurement of the frequency, and/or duration of the behavior is critical during this hypothesis-testing phase, in order to determine if the behavior is responding in the manner predicted. Based on the results of this probe, a long-term functionally related intervention strategy can be instituted.

Conclusion

It should be noted, of course, that there is always some risk when one moves from a reliance on the manipulation of observable, measurable variables to an attempt to interpret the actions of another. A strategy such as the one presented here cannot yield conclusive support for a hypothesis; for example, manipulation of antecedent variables could reduce behavior as a function of a stimulus change effect (LaVigna & Donnellan, in press) that is unrelated to the hypothesized function. However, this is not intended to be an intervention strategy. It is an assessment strategy to assist practitioners in developing non-aversive, constructive behavior management programs. It should be used by practitioners as part of ongoing assessment across a variety of situations, not as a one-time assessment. The strategy allows the practitioner to test a hypothesis in a systematic way and arrive at some reasonably objective conclusions as to the communicative function(s) of particular behaviors. Given the communicative difficulties presented by so many students with severe handicaps, the minor risks involved seem reasonable if such an assessment strategy can give practitioners some direction for designing interventions that are constructive, durable and functional.

Table 1
Summary of Motivational Sources, Possible Communicative Messages, and Related Interventions

		Intervention Procedures		
Motivational Source	Possible Communicative Message(s)	Teach Replacement Communicative Response	Functionally Related Alt-R Procedures	Manipulation of Antecedent Conditions
I. Positive Reinforcement:[a, b] *Attention* maintains behavior (Lovaas, Freitag, Gold, & Kassoria, 1965)	"Pay attention to me" (general) "Hello!" (greeting) "Look at me, I'm silly" (humor) "Play with me" "Look at ________" (comment) "Help me"	[Teach a variety of means for requesting/soliciting attention, depending on context (e.g., tap on arm, greeting sign, "Play," "Help," etc.; discussed by Carr, 1981; Durand, 1982)]	Use attention to reinforce already-occurring alternative responses (Hall, Lund, & Jackson, 1968; Lovaas et al., 1985) Direct instruction + social reinforcement of new alternative responses (Russo, Cataldo, & Cushing 1981)	Alter environment to provide non-contingent attention
Material reinforcers (e.g., food, objects) maintain behavior (Lovaas & Simmons, 1969)	"I want ________"	Teach manual sign for desired object/food (Carr, 1979; Horner & Budd, 1983)	Use desired materials to reinforce already-occurring alternative responses Direct instruction + material reinforcement of new, alternative responses (Favell, McGimsey, & Jones, 1978)	Alter environment to provide non-contingent access to material reinforcers (stimulus satiation, Ayllon, 1963)
II. Negative Reinforcement:[a, b] *Termination* of an aversive stimulus or situation maintains behavior (Carr, Newsom, & Binkhoff, 1978)	"I don't want to do this anymore" "Stop!" "No!" "I don't understand; I want out!"	Teach manual/gestural sign to terminate activity/escape (Carr, Newsom, & Binkhoff, 1980; discussed by Durand, 1982)	[Reinforce already-occurring alternative responses with escape]	Alter context to decrease/eliminate aversiveness: *simplify tasks* (Weeks & Gaylord-Ross, 1981); *increase preference value of tasks* (Carr et al., 1980; Gaylord-Ross, Weeks, & Lipner, 1980); *decrease or alter instructional demands* (Carr et al., 1978; Gaylord-Ross et al., 1980); *alter instructional procedures* (Weeks & Gaylord-Ross, 1981)
III. Extinction/Frustration:[b] Previously available reinforcers are no longer available (Baumeister & Forehand, 1971)	"Help me" "I'm frustrated" "Why can't I have. . .?" "You used to give __ to me; I want it now"	[Teach communicative means for obtaining desired reinforcers and/or for enlisting aid to obtain reinforcers]	[Reinstate previously available reinforcers contingent on occurrence of alternative response]	[Alter environment to provide previously available reinforcers: alter instructional procedures, provide richer reinforcement schedule, etc.]

Table 1 (Continued)
Summary of Motivational Sources, Possible Communicative Messages, and Related Interventions

		Intervention Procedures		
Motivational Source	Possible Communicative Message(s)	Teach Replacement Communicative Response	Functionally Related Alt-R Procedures	Manipulation of Antecedent Conditions
IV. Arousal Induction/sensory reinforcement:[a,b] Behavior provides sensory stimulation that is intrinsically reinforcing (Berkson, 1967)	"I'm not getting the input I want" "I'm bored"	[Teach communicative means to obtain sensory input, e.g., request for sensory activity (discussed by Durand, 1982)]	Provide reinforcing sensory input through alternative activities (Eason, White, & Newsom, 1982; Favell, McGimsey, & Schell, 1982) Direct Instruction + reinforcement of alternative behaviors (Mulick, Hoyt, Rojahn, & Schroeder, 1978)	Alter environment to provide more sensory input and stimulation: enrich environment and curriculum (Gaylord-Ross, 1980)
V. Arousal Reduction:[b] Behavior maintained by termination of aversive over-stimulation—i.e., behavior "blocks out" excess sensory input (Hutt & Hutt, 1965)	"I'm anxious/tense/excited/nervous/overwhelmed. etc." "Help me"	[Teach alternative communicative means for expressing distress/enlisting aid]	Provide and reinforce alternative means of removing the aversive effects of over-stimulation: *vigorous exercise* (Ohlsen, 1978; Kern, Koegel, Dyer, Blew, & Fenton, 1982); *relaxation response* (Graziano & Kean, 1971)	Alter environment to decrease environmental stimulation and demands (Weeks & Gaylord-Ross, 1981)
VI. Respondent Conditioning:[b] Behavior originated from association with a traumatic event (eg., loud noise, pain) that triggers the behavior (Wolpe, 1973). Behavior is then maintained by positive or negative reinforcement.	"I'm scared/afraid" "This is a bad habit that I can't control" "I want ______ to stop" "Help!"	[Teach communicative means to express distress or enlist assistance]	Reinforce gradual tolerance of trigger stimulus: systematic desensitization (Wolpe, 1973; see Mirenda, in press, for a review) [Direct instruction + reinforcement of alternative responses to trigger stimulus]	[Alter environment to preclude occurrence of the trigger stimulus]
VII. Physiological:[a,b] Behavior is the product of an aberrant physiological process (Cataldo & Harris, 1982)	"I hurt" "I'm tired"	[Teach communicative means to express distress]	Not applicable	Not applicable

a - discussed by Carr, 1977
b - discussed by Romanczyk, Kistner, & Shakelford, 1982

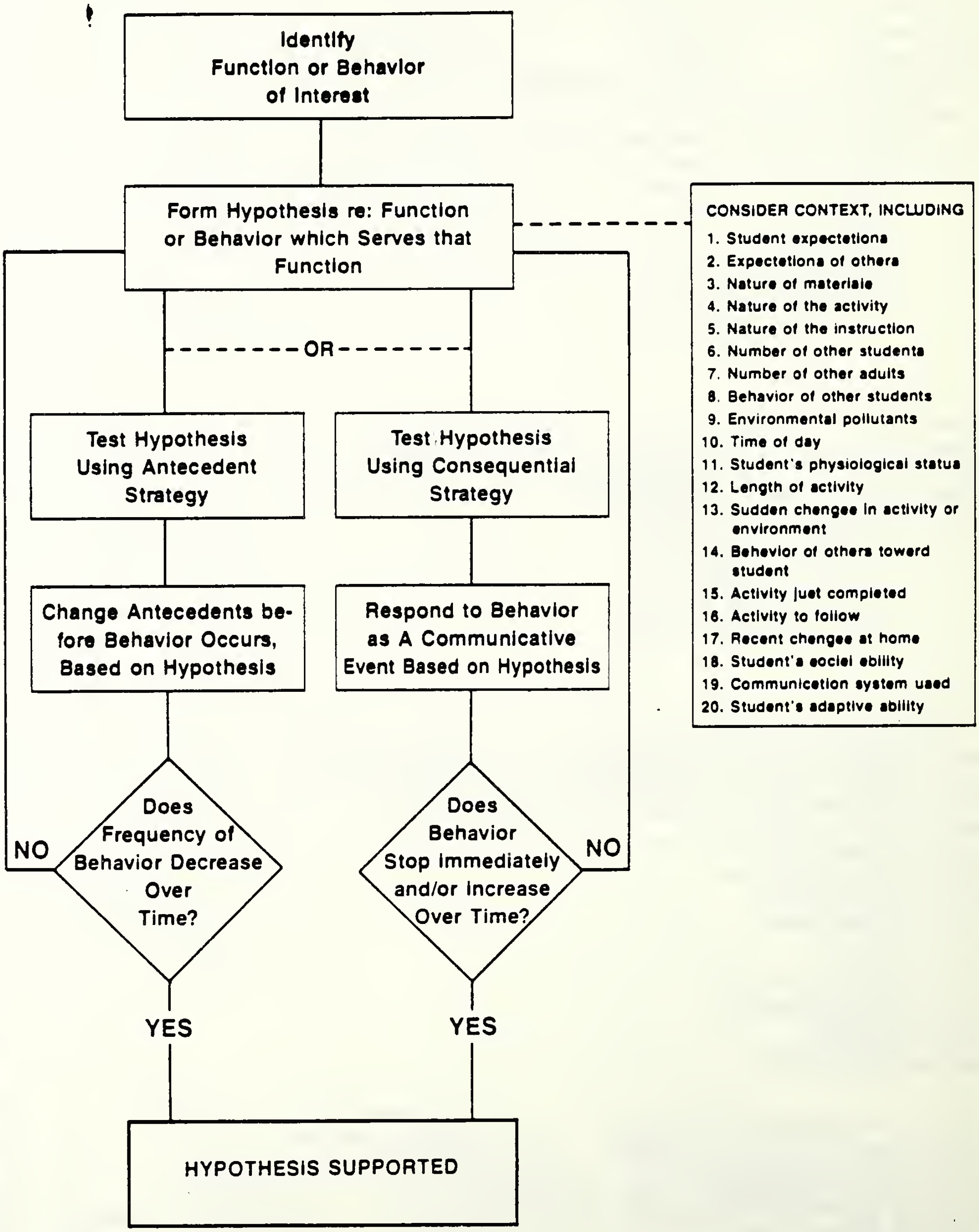

Identify Function or Behavior of Interest
Form Hypothesis re: Function or Behavior which Serves that Function
OR
Test Hypothesis Using Antecedent Strategy
Test Hypothesis Using Consequential Strategy
Change Antecedents before Behavior Occurs, Based on Hypothesis
Respond to Behavior as A Communicative Event Based on Hypothesis
Does Frequency of Behavior Decrease Over Time?
Does Behavior Stop Immediately and/or Increase Over Time?
NO
NO
YES
YES
HYPOTHESIS SUPPORTED
CONSIDER CONTEXT, INCLUDING
1. Student expectations
2. Expectations of others
3. Nature of materials
4. Nature of the activity
5. Nature of the instruction
6. Number of other students
7. Number of other adults
8. Behavior of other students
9. Environmental pollutants
10. Time of day
11. Student's physiological status
12. Length of activity
13. Sudden changes in activity or environment
14. Behavior of others toward student
15. Activity just completed
16. Activity to follow
17. Recent changes at home
18. Student's social ability
19. Communication system used
20. Student's adaptive ability

Figure 1. A strategy for analyzing the communicative functions of behavior.

Table 2

DEFINITIONS OF FUNCTIONAL CATEGORIES

I. INTERACTIVE FUNCTIONS

A. *Requests*

for attention - behaviors used to call attention to sender (e.g., showing off, teasing, flirting, etc.)

for social interaction - behaviors used to initiate a social exchange

for play interactions - behaviors that convey a desire on the part of the sender to engage in play with another person

for affection - behaviors that direct the receiver to engage in some physical activity specifically intended to convey a feeling of fondness

for permission to engage in an activity - behaviors that convey a desire on the part of the sender to engage in a particular action (e.g., bathroom, watch TV, etc.)

for action by receiver - behaviors that direct the receiver to cause an event to occur

for assistance - behaviors that direct the receiver to provide help

for information/clarification - behaviors that direct the receiver to provide information or clarification about an object, action, activity, location, etc.

for objects - behaviors that direct the receiver to provide an object to the sender (other than food)

for food - behaviors that specifically convey a desire for food or drink

B. *Negations*

protest - behaviors that express general objection to or disapproval of an event, request, etc.

refusal - behaviors that specifically express rejection of an event initiated or suggested by another

cessation - behaviors that specifically express a desire to terminate an event which has already begun

C. *Declarations/Comments*

about events/actions - behaviors that are used to comment on an event or occurrence (past, present, or future)

about objects/persons - behaviors used to comment about an object (including food), or about a person (e.g., compliments)

about errors/mistakes - behaviors that convey acknowledgement that the sender or another person has committed an error

affirmation - behaviors that convey agreement about or willingness to engage in an event or action

greeting - behaviors that occur subsequent to a person's entrance or appearance and express recognition

humor - behaviors intended to entertain the receiver and/or to evoke a response such as laughter

II. NON-INTERACTIVE FUNCTIONS

A. *Self-regulation*
behaviors used for the purpose of monitoring one's own behavior (e.g., self-control, self-correction)

B. *Rehearsal*
behaviors used to practice an event that has not yet occurred

C. *Habitual*
behaviors set by regular repetition in a predictable sequence

D. *Relaxation/Tension Release*
behaviors used for the purpose of self-entertainment or to calm oneself

FUNCTIONS \ BEHAVIORS	AGGRESSION	BIZARRE VERBALIZATIONS	INAPP. ORAL / ANAL BEHAVIOR	PERSEVERATIVE RITUALS	SELF-INJURIOUS BEHAVIOR	SELF-STIMULATION	TANTRUM	FACIAL EXPRESSION	GAZE AVERSION	GAZING / STARING	GESTURING / POINTING	HUGGING / KISSING	MASTURBATION	OBJECT MANIPULATION	PROXIMITY POSITIONING	PUSHING / PULLING	REACHING / GRABBING	RUNNING	TOUCHING	DELAYED ECHOLALIA	IMMEDIATE ECHOLALIA	LAUGHING / GIGGLING	SCREAM / YELL	SWEARING	VERBAL / PHYSICAL THREATS	WHINING / CRYING	COMPLEX SIGN / APPROXIMATION	COMPLEX SPEECH / APPROXIMATION	ONE WORD SIGN / APPROXIMATION	ONE WORD SPEECH / APPROX	PICTURE / WRITTEN WORD ...	•	•
I. INTERACTIVE																																	
A. REQUESTS FOR																																	
Attention																																	
Social interaction																																	
Play Interactions																																	
Affection																																	
Permission to Engage in an Activity																																	
Action by Receiver																																	
Assistance																																	
Information / Clarification																																	
Objects																																	
Food																																	
B. NEGATIONS																																	
Protest																																	
Refusal																																	
Cessation																																	
C. DECLARATIONS/COMMENTS																																	
About Events / Actions																																	
About Objects / Persons																																	
About Errors / Mistakes																																	
Affirmation																																	
Greeting																																	
Humor																																	
D. DECLARATIONS ABOUT FEELINGS																																	
Anticipation																																	
Boredom																																	
Confusion																																	
Fear																																	
Frustration																																	
Hurt Feelings																																	
Pain																																	
Pleasure																																	
II. NON-INTERACTIVE																																	
A. SELF-REGULATION																																	
B. REHEARSAL																																	
C. HABITUAL																																	
D. RELAXATION / TENSION RELEASE																																	

Student: ____________ Date: ____________ Time: ____________

Activity: ____________

Figure 2. An observation tool for analyzing the communicative functions of behavior.

References

Ayllon, T. (1963). Intensive treatment of psychotic behavior by stimulus satiation and food reinforcement. *Behaviour Research and Therapy, 1,* 53-61.

Bates, E. (1976). *Language and context: The acquisition of pragmatics.* New York: Academic Press.

Baumeister, A., & Forehand, K. (1971). Effects of extinction of an instrumental response on stereotyped body rocking in severe retardates. *The Psychological Record, 21,* 235-240.

Baumgart, D., Brown, L., Pumpian, I., Nisbet, J., Ford, A., Sweet, M., Messina, R., & Schroeder, J. (1982). Principle of partial participation and individualized adaptations in educational programs for severely handicapped students. *Journal of the Association for the Severely Handicapped, 7*(2), 17-27.

Berkson, G. (1967). Development of abnormal stereotyped behaviors. *Developmental Psychology, 1,* 118-132.

Carr, E. G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. *Psychological Bulletin, 84,* 800-816.

Carr, E. G. (1979). Teaching autistic children to use sign language: Some research issues. *Journal of Autism and Developmental Disorders, 9,* 345-359.

Carr, E. G. (1981). Analysis and remediation of severe behavior problems. In D. Park (Ed.), *The Proceedings of the 1981 International Conference on Autism* (pp. 313-317). Washington, DC: NSAC, National Society for Children and Adults with Autism.

Carr, E. G., Newsom, C. D., & Binkhoff, J. A. (1976). Stimulus control of self-destructive behavior in a psychotic child. *Journal of Abnormal Child Psychology, 4,* 139-153.

Carr, E., Newsom, C. D., & Binkhoff, J. A. (1980). Escape as a factor in the aggressive behavior of two retarded children. *Journal of Applied Behavior Analysis, 13,* 101-117.

Cataldo, M., & Harris, J. (1982). The biological basis for self-injury in the mentally retarded. *Analysis and Intervention in Developmental Disabilities, 2,* 21-39.

Chapman, R. S. (1981). Exploring children's communicative intents. In J. F. Miller (Ed.), *Assessing language production in children* (pp. 111-136). Baltimore: University Park Press.

Corte, H., Wolf, M. M., & Locke, B. J. (1971). A comparison of procedures in the elimination of self-injurious behavior of retarded adolescents. *Journal of Applied Behavior Analysis, 4,* 201-213.

Dietz, S. M., Repp, A. C., & Dietz, D. E. D. (1976). Reducing inappropriate classroom behavior of retarded students through three procedures of differential reinforcement. *Journal of Mental Deficiency Research, 20,* 155-170.

Durand, V. M. (1982) Analysis and intervention of self-injurious behavior. *Journal of the Association for the Severely Handicapped, 7*(4), 44-53.

Eason, L. J., White, M. J., & Newsom, C. (1982). Generalized reduction of self-stimulatory behavior: An effect of teaching appropriate play to autistic children. *Analysis and Intervention in Developmental Disabilities, 2,* 157-169.

Favell, J. E., McGimsey, J. F., & Jones, M. L. (1978). The use of physical restraint in the treatment of self-injury and as positive reinforcement. *Journal of Applied Behavior Analysis, 11,* 225-242.

Favell, J. E., McGimsey, J. F., & Schell, R. M. (1982). Treatment of self-injury by providing alternate sensory activities. *Analysis and Intervention in Developmental Disabilities, 2,* 83-104.

Gardner, W. I., & Cole, C. L. (1983). Selecting intervention procedures: What happened to behavioral assessment? In O. C. Karan & W. I. Gardner (Eds.), *Habilitation practices with the developmentally disabled who present behavioral and emotional disorders* (pp. 91-119). Madison, WI: Rehabilitation Research and Training Center in Mental Retardation.

Gaylord-Ross, R. J. (1980). A decision model for the treatment of aberrant behaviors in applied settings. In W. Sailor, B. Wilcox, & L. Brown (Eds.), *Methods of instruction for severely handicapped students* (pp. 135-158). Baltimore: Paul H. Brookes.

Gaylord-Ross, R. J., Weeks, M., & Lipner, C. (1980). An analysis of antecedent, response, and consequence events in the treatment of self-injurious behavior. *Education and Training of the Mentally Retarded, 15,* 35-42.

Graziano, A. M., & Kean, J. E. (1971). Programmed relaxation and reciprocal inhibition with psychotic children. In A. M. Graziano (Ed.), *Behavior therapy with children* (pp. 215-219). Chicago: Aldine.

Hall, R. V., Lund, D., & Jackson, D. (1968). Effects of teacher attention on study behavior. *Journal of Applied Behavior Analysis, 1,* 1-12.

Horner, R. H., & Budd, C. M. (1983). *Teaching manual sign language to a nonverbal student: Generalization of sign use and collateral reduction of maladaptive behavior.* Eugene, OR: University of Oregon Center on Human Development.

Hutt, C., & Hutt, S. (1965). Effects of environmental complexity on stereotyped behavior of children. *Animal Behavior, 13,* 1-4.

Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1982). Toward a functional analysis of self-injury. *Analysis and Intervention in Developmental Disabilities, 2,* 3-20.

Kern, L., Koegel, R. L., Dyer, K., Blew, P. A., & Fenton, L.R. (1982). The effects of physical exercise on self-stimulation and appropriate responding in autistic children. *Journal of Autism and Developmental Disorders, 12,* 399-419.

LaVigna, G. W., & Donnellan, A. M. (in press). *Alternatives to punishment: Non-aversive strategies for solving behavior problems.* New York: Irvington Press.

Lovaas, O. I., Berberich, J. P., Perloff, B. F., & Schaeffer, B. (1966). Acquisition of imitative speech in schizophrenic children. *Science, 151,* 705-707.

Lovaas, O. I., Freitag, G., Gold, V. J., & Kassorla, I. C. (1965). Experimental studies in childhood schizophrenia: I. Analysis of self-destructive behavior. *Journal of Experimental Child Psychology, 2,* 67-84.

Lovaas, O. I., Schaeffer, B., & Simmons, J. Q. (1965). Experimental studies in childhood schizophrenia: Building social behavior in autistic children by use of electric shock. *Journal of Experimental Research in Personality, 1,* 99-109.

Lovaas, O. I., & Simmons, J. Q. (1969). Manipulation of self-destruction in three retarded children. *Journal of Applied Behavior Analysis, 2,* 143–157.

Mirenda, P. (in press). Respondent conditioning procedures. In G. W. LaVigna & A. M. Donnellan, *Alternatives to punishment: Non-aversive strategies for solving behavior problems.* New York: Irvington Press.

Mirenda, P., Mesaros, R., Fassbender, L., Graczyk, M., McGinnity, K., Mendl, K., Proctor, T., Hiller, C., McDonough, M., Donnellan, A., & Gruenewald, L. (1983). A task force report on analysis of the communicative functions of behavior. In L. Brown, A. Ford, J. Nisbet, M. Sweet, B. Shiraga, J. York, & R. Loomis (Eds.), *Educational programs for severely handicapped students, Vol. XIII* (pp. 229–255). Madison, WI: Madison Metropolitan School District.

Mulick, J., Hoyt, R., Rojahn, J., & Schroeder, S. (1978). Reduction of a "nervous habit" in a profoundly retarded youth by increasing toy play: A case study. *Journal of Behavior Therapy and Experimental Psychiatry, 9,* 381–385.

Ohlsen, R. L. (1978). Control of body rocking in the blind through the use of vigorous exercise. *Journal of Instructional Psychology, 5,* 19–22.

Peck, C. A., Schuler, A. L., & Semmel, M. I. (1983). *Developing social competence in autistic and severely handicapped children: A curriculum planning guide.* Santa Barbara: University of California Special Education Research Institute.

Rogers-Warren, A., & Warren, S. F. (1977). *Ecological perspectives in behavior analysis.* Baltimore: University Park Press.

Romanczyk, R. G., Kistner, J. A., & Shakelford, M. (1982). Self-stimulatory and self-injurious behavior: Etiology and treatment. In J. J. Steffen & P. Karoly (Eds.), *Advances in child behavioral analysis and therapy: Vol. II. Autism and severe psychopathology* (pp. 189–255). Lexington, MA: Lexington Books.

Russo, D. C., Cataldo, M. F., & Cushing, P. J. (1981). Compliance training and behavioral covariation in the treatment of multiple behavior problems. *Journal of Applied Behavior Analysis, 14,* 209–222.

Schuler, A. L., & Goetz, C. (1981). The assessment of severe language disabilities: Communicative and cognitive considerations. *Analysis and Intervention in Developmental Disabilities, 1,* 333–346.

Solnick, J. V., Rincover, A., & Peterson, C. (1977). Some determinants of the reinforcing and punishing effects of time-out. *Journal of Applied Behavior Analysis, 10,* 415–424.

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis, 10,* 349–367.

Voeltz, L. M., & Evans, I. M. (1983). Educational validity: Procedures to evaluate outcomes in programs for severely handicapped learners. *Journal of the Association for the Severely Handicapped, 8*(1), 3–15.

Watzlawick, P., Beavin, J. H., & Jackson, D. D. (1967). *Pragmatics of human communication.* New York: W. W. Norton & Co.

Weeks, M., & Gaylord-Ross, R. (1981). Task difficulty and aberrant behavior in severely handicapped students. *Journal of Applied Behavior Analysis, 14,* 449–463.

Wolf, M. M. (1978). Social validity: The case for subjective measurement, or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 2,* 203–214.

Wolpe, J. (1973). *The practice of behavior therapy (2nd ed.).* Elmsford, NY: Pergamon.

Footnotes

[1] This paper was supported in part by *Contract No. 300-81-0355* to the University of Wisconsin-Madison in conjunction with the Madison Metropolitan School District from the Department of Education, Office of Special Education, Division for Innovation and Development, Washington, DC; and by *Grant No. NIE-G-81-0009* to the Wisconsin Center for Education Research from the National Institute of Education. The opinions expressed in this paper do not necessarily reflect the position, policy, or endorsement of the Department of Education or the National Institute of Education. The authors gratefully acknowledge the valuable suggestions made by Gary LaVigna and the technical assistance of Jeanne Connors in the preparation of this manuscript.

[2] The behaviors are clustered from left to right, in four groupings: (1) behaviors that are likely to be socially inappropriate; (2) physical behaviors; (3) vocal behaviors that can be either appropriate or inappropriate; and (4) behaviors that are likely to be socially appropriate. The behavioral definitions are available in LaVigna & Donnellan (in press).

Ann Silverrain, 1983 4a

ACTIVITIES THAT PROMOTE COMMUNICATION IN LOW FUNCTIONING MULTI-HANDICAPPED CHILDREN

Reflex Level (done with close body contact):

Body games/resonance (Van Dijk): This is something parents do naturally. All you need to do is make sure to pause between movements and wait for a signal from the child. The signal should be something other than just smiling or laughing if the child is capable of it, e.g. a twitch of the torso, a pat of the hand, a reach. (For some children severely immobilized by CP, a smile may be the only way of asking for more. . .look carefully here though for other very subtle signs the child produces, if any)

This is a very basic and very important foundation for more complex forms of communication to develop later. Nursery songs with body motions work well for this, even if child has a hearing impairment.

Examples:

1. Bounce child on your lap. Pause. Wait for child to signal with his body for more then bounce again.
2. Sway right to left with child in your lap.
3. Rock forward and backward with child in your lap.
4. Hold child's hands or ankles and jiggle arms or legs firmly and fast. Stand and jump with child on trampoline. Come to a stop and wait for child's signal.
5. A two movement sequence: Put child in your lap and first sway side to side then rock forward and backward. Do this several times. Make sure that you give the child a physical cue as to which movement is coming next; e.g., position the child's arms forward as you rock forward. Position his arms to each side holding your hands as you sway side to side. After several repetitions see if child is anticipating next move by watching where he places his hands.

I. Signals: Ways to get child to signal to you.

A. Involving Movement [Similar to Reflex Level but more distance between adult and child. Child generates his own signal spontaneously. Must be more than a smile or a laugh.]

* 1. Put child in hammock and swing him/her. Pause. Wait for signal- may be a body wiggle, leg wiggle, a clap, etc. Repeat a number of times.
2. Pull child in a wagon. Pause. Signal might be that child bangs side of wagon or moves his torso forward, etc.
3. Push child on swing. Make swing stop.
4. Roll child over large therapy ball. Pause.
5. Pull child on floor while he sits or lies on blanket.
6. Jump with child on trampoline.
7. Push child in a cardboard box.
8. Run down the hall or outside holding child's hand.

* All activities listed require pausing and waiting for child's signal.

9. Two adults pickup child by arms and legs and swing him/her. Then place him/her back down on floor.
10. Hold child by armpits and swing around so feet are flying out. Stop and stand child up. Wait. See if child tries to reposition himself for more by backing up to you, for example.
11. Make a sequence of any two of the above--see if the child's anticipates the next movement by body positioning, tugging on you, etc.

B. Signals Involving Objects:

Do not use "educational" or "put together" toys. Use toys or objects that have some action. Also, the action should be such that the child needs you to make it happen again.

1. Turn flashlight on and give it to child to play with briefly. Then turn it off and leave your hands very close to the flashlight. See if child will push flashlight to you, or touch your hand. Then turn it on again, etc.
2. If child can turn flashlight on by him or herself, then put the flashlight in a container that the child can't open but needs your help to open.
3. Or, put flashlight on a shelf just out of reach. Stand close by with your hands close to the shelf. See if child pushes your arm toward the flashlight.
4. Toss a blanket or sheet over the child and pull it off. Chase child around room with the sheet tossing it on him. Let sheet drop to floor. Does child take sheet to you or push you toward the sheet for more?
5. Play dumb: when it's recess time, stand by the door waiting to go outside, or waiting to get in the car, etc. Will child touch you or the door knob? Try leaving your hand close to the door knob.
6. Turn on vibrator and give to child briefly. Turn it off. Will he hand it back? Similar to flashlight activities.
7. "Pound-a-Round" toy or top-like spinning toy. If child enjoys the movement and noise, try leaving your hands very near (3" away) - Does child push your hand toward toy, or look at you expectantly while tapping the toy?
8. Any number of wind-up type toys. Leave your hands close by for child to touch, or to hand you back the toy.
9. Squirt a dab of shaving cream on a mirror. If child touches your hand or the squirt canister, do it again. Play with it on the mirror, of course.
10. While putting on child's shoes, after you've got one on , play dumb. Wait to see if child notices and tries to get your attention somehow.
11. Blow up a balloon while child watches. Hand the untied balloon to child so all the air comes out. Repeat several times. Does child finally push the balloon to your mouth.
12. Blow bubbles for child to watch, (using a wand). Let child help you hold the wand as you dip and blow. When you let child have the wand, does she/he give it back to you or try to place it in the container? Close up the lid and leave your hands close by. Will child push it to you?

13. Step on child's foot. Will child push you off?
14. Stand in child's way on his determined path to the lunchroom. Get down to face-to-face level. Allow yourself to be pushed aside.
15. After child has been manipulated through using the calendar shelf or "symbol shelf", does she/he begin to obtain the object prior to the upcoming activity?
16. Let child watch you put his or her favorite cookies in a transparent, but tight-lid container. Will he finally push the container to you to get you to open it?
17. While sitting at the table for juice time or lunch time, hold up to the child his juice and a sock. Child may stare at you blankly. Just wait and ask "do you want juice?" or "which one do you want?". See if child reaches for the cup.
18. Present child with a choice of bowl of fruit/cookies etc., and a bowl of crumpled paper.
19. While child is sitting with plate of food in front, and obviously hungry, show child a spoon and a stick. See if he will stare at or reach for the spoon. Either way, make a big deal if he chooses correctly: "Oh, you want the spoon!; Good! Let's eat.", etc.

CHOICES/COMMUNICATION

Not enough can be stressed about the importance of building in a system of giving the infant or child choices. As soon as the child is able to reach (does not need to be accurate reach, just in general direction of desired object/person) you should begin to present 2 toys simultaneously to see if you can discover a pattern of preferences which you can use to build later activities. Then present 3 objects, etc.

Choices can then be used on a communication board or symbol shelf using real objects; later pictures of objects, etc., if child is speech delayed/handicapped. Also, look for child's use of spontaneous natural gesture (an action which he performs on the toy). Often the sight or sound of the toy will bring forth the natural gesture for it.

Choices can also be used with the totally blind child using toys with different sounds/textures.

Mobility impaired children who cannot reach but can activate switches can be given two switches to operate, and can choose their favorite toy, etc. If they have enough vision, they can use a "visual point" as their choice mechanism.

II. Copying/Imitation

Part of this area is also known as "Non-representational reference" (Van Dijk).

FROM IMITATION TO PICTURES; FROM CONCRETE TO ABSTRACT

A. Copying - Until child knows that his body corresponds to a graphic representation of a person, he/she will not fully understand pictures. To get to this point:

1. Child should be able to imitate your limb movements (symmetrical is easier than asymmetrical).

2. Should next be able to imitate limb movements of a large doll.
3. Should next be able to imitate large cardboard figure with brads at joints.
4. Should next be able to imitate small cardboard figure with brads at joints.
5. Should next be able to imitate drawn figures similar to small cardboard figure.
6. Should next be able to imitate stick figures drawn as child watches.

Multi-handicapped children frequently have problems understanding that a picture represents a real object or person. This can be due to various visual problems or visual processing problems. Here are some tips I have found helpful.

B. Mirrors

1. Spend a lot of time working with the child in front of a mirror during their Stage II and Stage III of Sensorimotor development. Leave the mirror (plastic and unbreakable) close to the child during free play time. Here the child is being exposed to "pictures" of himself and the toys.
2. Use the mirror as a surface to manipulate objects on.
3. Play with moving the mirror around the child, e.g. circling around, holding above his/her head.

(Note: Plastic Mirrors (2'x2') available from: Sidiki Mirrors, Intermark Corporation, 24 N.E. Wilson Avenue, Saint Cloud, Minn. 56301 for $29.95 each plus 8% shipping.)

C. Clear Photographic Type Pictures

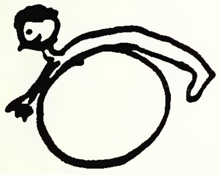
Can be used during work on #2 - using child's favorite toys and common objects. Present picture simultaneously with presentation of toy. Watch to see if child looks back and forth between the object and the picture, or if she/he tries to grab at the picture as if it were a real object. To begin, use pictures (photo type) or careful drawings that are the same size and coloring of the real object.

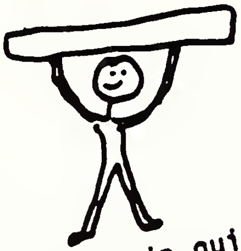
Play "choice games" presenting two pictures of favorite objects. Whichever one the child stares at the most, or reaches for, immediately present child with the real object. Later, choices can be expanded to 3 or more, used on communication boards, etc.

D. Correlating Self with Picture of Self

Using action on large object, mirror image, and black marker drawing of self doing the action (teacher draws while child "helps" with hand over teacher's).

done #1 through #4 of A, you can start this activity. Assuming
being rolled across large beach ball, or therapy ball, or
this activity in front of large mirror. Next, with a black magic
large sheet of white paper, have child place his or her hand over
u quickly draw a stick figures of the child doing the same.





ball is of a particular color, color it in quickly while child "helps"
ke child back to mirror and ball for more action, pointing to mirror
drawing frequently.

ld has a favorite toy, e.g. a doll, place doll on ball and do same.
doll with child's help as above, and place this picture of doll on top
ll as well. (Note: Your drawing can be very crude. Quickness is impor-
so as not to lose child's attention.)

session do a new drawing, or series of drawings, using various objects
ilar to big ball activity. Do not use drawings from previous days.

es

atural gesture is a movement that represents how an object is used or how the
moves the object and is the beginning of true representational (symbolic)
unication. The natural gesture can be a step toward formal language (speech
ign).

FROM: Judy Young Burton "Beginning Communication", Pre-Symbolic Skills with Multi-handicapped Children in T.E.A. publication Educational Methods for Deaf-Blind and Severely Handicapped Students Vol. II, 1979

XAMPLES:

the gesture for	what it looks like
Drink (noun)	pantomine of bringing cup to mouth
Pound-a-Round	pushing up and down motion with hand
Ball	tossing motion with hand
Hammer	hammering motion

V. Pointing

Pointing is a high level communication standing for "that over there" or "this thing here" or "that direction". Children who point have good potential for a formal language system.

/I. Formal Language System

Speech, sign, communication boards

CHAPTER 3

A PRELANGUAGE PROGRAM FOR THE MULTIHANDICAPPED BASED ON THE VAN DIJK APPROACH

By: The Teaching Staff of the Regional Residential Deaf-Blind Program

Kelly Yost	Nancy Perotti	Linda Madsen
Linda Westover	Barb C. Meese	Chris Curtis

Introduction

The teaching staff of the Regional Deaf-Blind Program at the Colorado School for the Deaf and Blind has for several years been incorporating much of the philosophy and ideas learned from presentations and resources based on the Van Dijk motor development approach to the education of Deaf-Blind children. Information which has led to a cohesive and successful approach to prelanguage training has been absorbed from presentations and papers by Jan Van Dijk, the director of the Department for the Multihandicapped, Deaf and Deaf-Blind at the School for the Deaf in St. Michielsgestel, Holland; Kathy Turiansky, formerly supervisor of the Deaf-Blind Program, Rutland, Vermont; Lieke De Leuw, teacher at the Michigan School for the Blind; and M. A. Sopers, teacher at the School for the Deaf, St. Michielsgestel.

The following chapter is an initial attempt at presenting a draft of the complete program which has been developed at the Regional Program in Colorado Springs. This chapter will be included in a total curriculum guide for a Prelanguage Program which will be written by the teaching staff during the summer of 1978 and disseminated through Colorado School for the Deaf and Blind.

The Theory

The article which best defines the theory leading to the development of Van Dijk's approach to the education of the Deaf-Blind is his research-based article, "The Non-Verbal Deaf-Blind Child and His World, His Outgrowth Toward the World of Symbols." This article is published in a volume titled Verzamelde Studies I printed by the Instituut Voor Doven, Sint Michielsgestel, Holland.

In this article, Van Dijk develops his theory leading to the child's growth towards consciousness of symbols. The child's initial relationship and understanding of the things in his world is based upon motor-patterns and his handling of things. Kephart says that "motor experimentation and motor learnings become the foundation upon which subsequent learning is built." In many ways, the world of the deaf-blind multihandicapped child is limited to the child himself. The world outside of him is used in an undifferentiated way for bodily satisfaction and self stimulation. Since his world does not go farther than his own body, the deaf-blind child's relationship to people and objects remains on a very primitive level.

Van Dijk encourages the development of distance between the child and his ingrown world and describes human development as the "task of growing to an increasing distance." The teacher can assist the child's communication with the world by establishing a "moving-acting-relationship" with him.

An initial basic requirement of this program is the development of a nurturing relationship with the child. A rapport must be established before the teacher can lead the child to a new and undiscovered world.

The teacher can initiate a "dialogue" between the child and his world and can bring the child to an awareness of himself as somebody who is able to produce meaningful movements. When the child is aware that it is he who acts and that he is the center of the movement, he can then learn to structure his world.

Because the teacher must enter the child's world, moving with the child, all traditional "classroom" structures and educational programs which try to "fit" the child into an adult world become obsolete.

Stages Leading to Symbolic Language

Van Dijk has identified several stages leading to symbolic language. These stages have been identified as resonance phenomenon; co-active movement; non-representational reference, imitation; and natural gesture. Once the nurturing and trusting relationship is established, the initial stage of resonance phenomenon can be introduced. The stages are not mutually exclusive, therefore the child can be moving through several stages simultaneously.

Resonance Phenomenon

In the Van Dijk model this is beginning level for developing dialogue through movement. The child comes to the understanding that he can have some control over his world by using his body to communicate.

The teacher begins by observing the child's gross body movements and becoming physically involved with the child in one of those movements. An important point is that the directive, in the form of a total bodily gesture, comes from the child. For example: A child spends much time rocking back and forth. The teacher observes that this child has no formal means of communication or interest in communicating.

The teacher initiates communication with the child at his level, getting on the floor with the child on her lap and beginning the same rocking motion. She encourages communication from the child by stopping briefly as they both rock and waiting for a signal from the child indicating that he wants to continue moving. The child may push his head against the teacher's chest. She would interpret this as a signal because it's part of the rocking movement. She would then reinforce this communication by resuming rocking with the child. The teacher can talk and sing to the child as they rock, establishing a closeness by holding the child's head against her chest, and by starting or stopping the singing as the movement starts and stops.

If the child does not offer a gesture indicating that he wants to continue moving, (communication through bodily movement), the teacher might shape an appropriate gesture that is part of the movement. It's fun to try several different movements to find which ones the child enjoys best. Different movements will require different gestures from the child: one gesture for bouncing, a different gesture for rocking and still another for swaying. The child now has a communication system that is his own. He can let the teacher know which way he wants to move by initiating a particular bodily movement or gesture.

The key to the resonance phenomenon level is that the gesture comes from the child's movements, rather than a set of arbitrary symbols that have been imposed on him by the outside world.

Co-Active Movement

Once the child is giving consistent gestures for different bodily movements at the resonance phenomenon level then it is time to move on to the co-active level.

Begin the co-active level with a movement that the child is familiar with from his experience with resonance phenomenon. The bodily contact between teacher and child is still very close, and so the term co-active.

Co-active movement involves moving through space with the child in a defined area. For example: the teacher and child scoot the length of a floor mat together. At the end of the mat, they may change to a crawl position and crawl back to the beginning of the mat. This scoot and crawl makes one co-active sequence. If each sequence is repeated three times, on the third try the teacher pauses when it is time to change positions to see if the child can remember the second position.

In this process both memory and anticipation, very important elements of language, are developed. When about three sequences are done during the co-active movement time each day, the child can get an idea of what is expected of him. It is important to change the movements within each sequence every day. This prevents "rote" learning and forces the child to watch, think and anticipate changes on his own.

As the child learns to anticipate change within the sequence, then the sequences can become more complicated. The contact is still close, with the child and teacher side by side.

More changes in the sequences, more limb positions (like kicking feet or clapping hands while walking) can be added. After the child is attending well and following changes, the teacher increases the distance between herself and the child. The teacher can begin the sequence and have the child join her. This distancing should gradually increase until the child is sitting, watching and remembering an entire sequence. It may be necessary to go back to more simple sequences when the teacher begins distancing. Sequences can become more complicated as the child's memory skills and attention span increase.

When the child is able to sit and attend to an entire sequence, and do it correctly, then he has reached the very important level of IMITATION.

He can begin by imitating gross body movements, body positions, limb movements, positioning an object, hand movements (signs) and eventually finger positions (finger spelling).

Non-Representational Reference

This area is initiated at the resonance phenomenon level and is developed concurrently with the other levels. The purpose of the activities in this area is to assist the child in understanding symbols. Initially, the child develops body image and the ability to attend to another person. During this stage the child is manipulated through rubbing each of his body parts after the teacher has rubbed the same part on herself. After the child can imitate rubbing and various limb movements without being manipulated; they move on to more abstract representations of a person. When the child understands that the teacher's body parts can represent his body parts, a more abstract, three-dimensional figure can be introduced (such as a cloth doll). A detailed procedure is repeated with the 3-D figure, a cardboard or 2-dimensional figure, then stick figure drawings.

Sequence Boxes:

When the child reaches the co-active level, sequence boxes or calendar boxes can be introduced. Each child can have an individual calendar box representing the morning and/or afternoon activities. The box is made in four to six sections, each containing an object to represent the lessons or activities of the day. The object can be something the child uses in the lesson, for example a plate and cup for meals, a ball for motor work, or something to designate an activity like putting on a t-shirt for mat work.

When the child can get the object and put it away after each activity, then he can begin to trace the object. The child can co-actively get crayons and paper, and trace around the object before and after the activity. He then places the drawing in the appropriate section of the memory box.

Once the child has experienced tracing each object and has been working on tracing during his lessons and daily activities, different objects for

different activities can be introduced according to changes in the routine.

Concurrently, the child is working on imitation and drawing the stick figure which can be introduced co-actively to each tracing which is placed in the box. The stick figure should look like the child as much as possible and represent the child being actively involved in each activity. As the child begins to imitate the drawing of circles or lines, the teacher can guide the child by holding the wrist and then by a tactile cue to make the correct representations of body or object.

Once the child is drawing a simple representation of himself acting upon an object for each section of his calendar box, he should have some understanding of pictures generalized to all of his daily activities. The sequence box is no longer needed and the child should be able to follow a daily routine by referring to a "calendar" or sequence of figure-object pictures representing his daily activities.

The drawing is a communication between teacher and child. Different parts are drawn by each and changed often.

Boxes at the bottom of each pictured activity can represent the concept of days of the week. The child marks off each activity when he has completed it. Picture sequences can be expanded beyond the picture calendar to individual lessons, self-help skills, the choosing of chores or language units. A picture chart can be drawn for all of the morning or afternoon activities so the child can refer to the picture sequence, do the initial activity, look at the following picture and move on to the next activity independently.

Communication can be encouraged by using the calendar in the classroom. The child can draw in special activities for each day of the week. At this point the child can begin to learn the concepts in the formal calendar, selecting days of the week, discussing weather, dressing appropriately for weather. The language unit activity for each week can be drawn on the calendar. Words can be introduced at the bottom of each picture, as the child is learning the alphabet and structured sentence patterns.

Drawings:

Drawings are very useful tools. When a child understands drawings, it demonstrates that he is minimally at a certain level of symbolic functioning.

Drawing is a way the child will have of communicating his experiences before he can communicate through a more formal system. It will be an expression and a growth of his inner language.

Initially, when a child has no object concept (i.e., cannot match object to object), it is important to go through the process of object drawing (as listed under the sequence box section). Later, it is important to include the child in the picture with some representation of what he has been doing so that he develops an orientation of interaction instead of purely an object sense. Just as conversations involve people expressing what they have been doing, so should the child's drawing be an expression of his involvement in an activity.

It appears that many deaf-blind multihandicapped children have a sense of objects, but not how they relate to an object. Drawings that show only objects are insufficient in that they fail to show the child interacting with the object or people. This drawing provides a permanent description and can be referred to, to help provide and expand language that describes the original action.

So the adult is responsible for helping the child to integrate the sensory pathways by continually directing the child's vision, talking to him, touching him. All these interactions need to be done in a very systematic, organized way.

The drawing procedure can be done preceding or following an activity, either as a signal to the child of the type of activity that is coming up, or as a "conversation" about the activity. The drawing done preceding an activity should be largely the adult's as an expression of the adult informing the child of what is going to happen. By saying the drawing should be "largely the adult's," it is meant that the adult should do much of the drawing with the child's hand on his, the child's attention directed, etc.

Whether a picture is drawn preceding an activity or not, there needs to be some concrete signalling to the child as to the nature of the upcoming

activity. This can be done in the form of showing the child the actual objects to be used in the activity and making some kind of natural gesture showing the type of movement that will be involved in the activity. This signalling can then be followed by the drawing of the child in such an activity or the activity itself. Following the activity another signalling would be needed to tell the child that you both were going to draw a picture of the activity you just completed. At this time the child is learning to communicate about his activities.

The teacher's own drawing ability is not important. A circle for the head, another for the body, with stick legs and arms will suffice. This type of drawing will be easier for the child to reproduce.

When the child is drawing himself and objects independently but with a faulty perception of the action (i.e., a child sawing-wood, is drawn as three separate pictures :one of the child, one of the wood and one of the saw), you could do your own drawing with the child holding the saw which is cutting wood. This would give the child a correct model from which to base his next drawing on.

The child will receptively understand pictures before he will draw them himself. Once drawings are understood, they can be used as aids to indicate a future event, document a past event, increase language, and provide a way for a child to express his perception of himself in relation to objects, his peers, and his family.

Natural Gestures

Like non-representational reference, this area is also developed concurrently with the other areas. A natural gesture is a signal which is personal and possibly unique to a child. The child's natural gesture coincides with the meaning a certain object has for a particular child. Because our basic concepts are built upon motor patterns, the roots of our concepts are activities or what we can do with an object.

In normal development a child first expresses himself by using his body to represent objects, the motor representation of the object showing what you can do with it (Van Dijk). Therefore the first gestures we use with a child should be gestures which imitate the "motor play" that child is involved in with that object. Some examples of natural gestures are: if a child tosses a ball

underhand with both hands, then the natural gesture for ball for that child would be that action; if a child rocks a doll in her arms, then her natural gesture for doll is that rocking motion. A natural gesture will come from the teacher observing the child's action with an object. These natural gestures will be used by the teacher as she is presenting the object to the child, as the child is using the object, or at any other time reference is made to the object.

Another necessary step in this procedure is the "co-active" level of natural gestures. The teacher will need to manipulate the child through the gesture many times before the child is able to make a natural gesture in imitation or independently.

An important consideration in making the natural gesture a part of the total program is that of time structuring. A consistent schedule where the same types of activities and gestures are done at the same times each day sets up the climate for anticipation.

In this type of setting a fabricated delay could motivate the child to make a gesture for an expected activity. Anticipation, then, in the sense of giving the child the opportunity to express what he knows, is an integral part of the program.

According to Van Dijk, one can only go on to the next stages of language development if one has gone through this stage of the natural symbol. A child should have a wide range of natural gestures before a formal signing system is begun. Ideally, the child should be creating her own natural gestures to communicate wants and needs.

As child moves into a formal signing system,it will be necessary to pair the child's natural gesture with the sign to give meaning to this more abstract level.

Program Implementation

For this program to function ideally a total program approach and philosophy must be accepted by the entire staff and administration. Since

services for deaf-blind and multihandicapped children are provided in many different settings, the program schedules staff assignments and environment should be used as optimally as possible. Many aspects of this program can be implemented without the perfect setting or conditions.

The strategy is that all aspects of the program lead towards the development of symbolic language. The establishment of a consistent daily routine is necessary so that the child can quickly learn to anticipate a series of events. Teaching dressing skills, bathing and preparation of simple meals, can be done with the child at his appropriate prelanguage level (i.e., manipulation, gestures...). Because these activities occur daily and are personal to the child they become the obvious subjects for the development of dialogue. All skills are taught in totality so the child learns an entire skill. For example, he gets his towel and washcloth, goes into the bathroom, turns on and adjusts the water, bathes and rinses each body part, gets out of the tub, dries himself and dresses.

Conversely no skill is taught in isolation. The children do not only learn to match colored cards; they also learn to match their clothing as it is put away after doing the laundry. This approach insures that all components of the program become organized and meaningful with language as the cohesive medium.

INTERRELATING VAN DIJK AND PIAGET

or

PIAGET AND VAN DIJK: AN ATTEMPT AT SYNTHESIS

by Pat S. Day

This paper will explore the relationship between two bodies of information already discussed in Chapters 2 and 3. The good will be to relate the theory of Piaget with the methodology of Van Dijk so that implications can be made about decisions on program-planning for your students.

A Piagetian model of the development of cognition has been presented so that you will be aware of the different levels of functioning that children will exhibit, what those levels mean about the child's organization of information from the environment, and where your planning for the child should be directing his growth. The theory also gives some ideas about the basic mechanisms through which development occurs: 1) learning should be based in action--preferably the child's own actions; 2) "steps" in learning should be very small, so that they are close enough to what the child already knows or already does to make assimilation and accomodation possible. These two ideas have definite implications for the way in which a learning environment should be set up and program planning should be accomplished. Piaget himself has not set out to take these theoretical ideas and spell out exactly what they mean for the direction of an individual program plan. He has left the setting up of educational programming based on his theory to the individual practicioner.

The Van Dijk method of building communicative and representational abilities is a set of activities, a plan for programming. The program is based on a certain set of theoretical assumptions about the way in which learning occurs. Although Van Dijk makes clear that his programming ideas were not taken from Piagetian theory, this paper will propose that many of the concepts he uses are also represented in the work of Piaget. Other

ideas from Van Dijk complement and significantly add to the picture of learning given by Piaget.

You as teachers are being asked to use Piagetian theory both in assessing the child's level of development and in setting up general, overall program goals. You may simultaneously be using the Van Dijk methodology for setting up specific, shorter range programming. Table I is a preliminary attempt to determine where the types of activities proposed by Van Dijk fit within the Piagetian model of the stages of cognitive growth.[1] Note that only stages in the Sensorimotor Period are considered. This is because the level of communication toward which the Van Dijk approach aims (that is, communicating through abstract signs or words) represents the level of symbolic ability considered in Piagetian theory to be the highest stage of sensorimotor cognitive abilities. The table also includes some information about the development of expression of communicative intentions which has significance both for Piagetian theory and Van Dijk methodology. Please remember that the table of relationships should not be taken too literally. The following paragraphs will give reasons for the correlations shown and will make some qualifications about those relationships.

TABLE I

Sensorimotor State (Piaget)	Van Dijk Level	Communication Studies
1	Resonance	
2		
3	Co-active Movement	
4	Non-Representational	Expresses intentions through sensorimotor behaviors
5	Natural Gesture	
6	Symbolic Representation	Expresses intentions through words

Note: 1. Ideas about the relationships shown in TABLE I were contributed by two experienced teachers of deaf-blind children: Judy Burton and Joe Fitzgerald. Their assistance is greatly appreciated.)

Resonance

Resonance level activities should be done with children who are in sensorimotor cognitive stages 1 and 2. Recall that at stage 1, behaviors are random or reflexive. At stage 2. the child can repeat his own familiar movement at will. For a child who is still at stage 1. acquisition of the ability to repeat behaviors or perform primary circular reactions should be the goal in early resonance activities. This level of behavior must exist before you begin to try to get signaling behavior from the child.

There are instances when you would use resonance activities with a child who is showing cognitive behaviors above those of stage 2. The following are some reasons why this would be done.

1) A child may have a communicative dificit far greater than the cognitive deficit, and programming must begin down at his communicative level. Such a child may function with objects at higher stages but may not give any signals and not respond to cues and signals given to him by other people. He may not seem to be "tuned in" to the people around him: pay no attention to them; not try to interact or get help from them. Such a pattern of differential attention to objects and people is not uncommon in the profoundly-delayed population. Programming efforts in each area of development should be geared to the child's ability in that particular area.

2) A child may need extra time spent in resonance behaviors to help him acquire a sufficient body of primary circular reactions for use in learning other behaviors. Piaget's theory is based upon behavior seen in normally-developing children, who are usually active explorers of their environment. Whatever their level, they tend to seek out stimulation and experiences.. Many deaf-blind children do not act in this way. They must be helped to build primary and secondary circular reactions so that they have a behavioral base with which to perform higher level communicative and imitation tasks. It is important to help the child expand his behavioral repertoire horizontally. In fact, focusing efforts purely upon his reaching higher levels of signaling or imitation behavior can be detrimental. He needs to be able to perform many behaviors at the same level if his step upward is to be facilitated. It has been suggested (Judy Burton, personal communication) that the number of resonance behaviors

the child knows should number as many as 20 or 25 before co-active movements are begun.

This idea is supported by the work of Dr. W. Beth Stephens, which indicated that expanding the abilities of older blind children horizontally--that is, filling in gaps within a level--was the most efficient way to facilitate their stepping to a higher level of functioning. Because of these considerations, you may decide to begin some very simple co-active movements with a child, involving direct contact and very familiar movements, while still building up the number of resonance activities in which the child engages.

3) Development of a new behavior may be best facilitated by beginning at a level a step lower than that at which the child usually operates. The Van Dijk approach typically involves beginning at a lower level with any new activity. This is especially important for deaf-blind children, who don't often show the spontanious development of new behaviors. Both the Van Dijk method and Piaget's theory take into account the fact that a child shouldn't be having to use a new behavior to learn another new behavior. This is true at all levels of learning, but may be most obvious at the sensorimotor level. You don't try to teach a child to reach out and grab a moving object until his ability to reach accurately for stationary objects is very well established. You should be careful not to test for object permanence by requiring reaching and lifting motions which are still rather difficult for the child to perform motorically. Don't add cognitive difficulty to a task which is motorically difficult.

Co-active Movement

Co-active movement activities are most appropriate for the child at sensorimotor cognitive stages 3, 4 and perhaps at early stage 5. Remember that it is at stage 3 that the secondary circular reaction develops. This differs from the primary circular reaction in that the child's attention is directed toward an object and its behavior, rather than just being centered on his own sensations. Sporatic imitation--occasional imitation of a behavior the child already knows and performs frequently--also occurs. Both of these abilities are necessary for the accomplishment of co-active

movement.

When co-active is begun (with a child who is probably low stage 3), the teacher and child will be in actual contact. The activity should involve movements well-known to the individual child. Only gradually will there be distance between the child and the teacher, and only later should any behaviors be used in the co-active movement activities that are new to the child. The co-active movement activities build toward imitative behaviors in the child.

Van Dijk focused on different aspects of the child's imitative behaviors than did Piaget. Piaget's view of the development of imitation emphasized the child's progression from repetition of only his own well-known behaviors to imitation of new behaviors without any physical trial and error. The focus was upon the child's developing ability to store and manipulate, or "try-out" behaviors mentally. The Van Dijk approach emphasizes the progression from repetition of a behavior when the adult is in direct contact with the child and is providing a simultaneous model of the behavior, to imitating when the adult is at a distance from the child and is providing the model behavior alternately with the child's response. The two approaches also show some similarities. Both emphasize that the child must be able to direct his attention outward and develop memory abilities in order to imitate. The two views of the process of development of imitation abilities are complementary, and when combined, give a good sense of the component knowledge required in order to imitate.

Non-Representational Reference

The child who shows behaviors indicative of late sensorimotor stage 4 is ready to begin Van Dijk training in non-representational reference. These activities begin co-actively and build to a level at which the child can use pointing and drawing. They are appropriate from the late stage 4 through the end of the sensorimotor period.

The stage 5 child should be capable of indicating body parts by pointing. It appears, however, that many deaf-blind children who show level 5 behaviors with objects are still not able to point communicatively. There seems to be a significant developmental step between the

ability to communicate with a person by directly touching him and communicating with him by pointing and gestures not involving contact. The ability to point, whether with open hand or one finger, is an important precursor of representational language ability. That is why the Van Dijk non-representational reference activities are so important.

The memory box or memory shelves are also used during these stages, with the child working at the level of tracing the object or pointing and Co-actively drawing the object, It is too early to ask the child to draw the activity himself and derive meaning from that activity, because he is not yet "representational."

The transition from stage 4 to stage 5 represents an important break in the general type of mental behavior demonstrated by the child. Up to this point, he has been working to build memory for exisiting, often-performed behaviors. Now he starts storing in memory and rearranging or re-organizing those behaviors so that he can create novel effects and recreate novel movements.

Research in early use of communication in normally-developing children has shown that it is only at sensorimotor stage 5 that they begin to consistently express intentional meaning in recognizable ways. They make simple sounds, point, obtain and direct adult attention, etc. They are able to express at least two communicative meanings, 1) declarative intentions (directing another's person to an object or themselves); 2) imperative intentions (requesting an action or object from the adult). It is only at this stage that the child fully understands that an adult can be used to obtain an object or satisfy a need--and, that specific signals can be used to get that adult to perform the desired activity. It is this kind of communicative behavior that the Van Dijk methodology has been working toward.

Natural Gesture

By late stage 5, the child may be able to use natural gestures as a representational system. Remember that the natural gesture is not a novel movement for the child. It is instead a replication of his own habitual movement when performing the activity or using the object which

it represents. Again, the Van Dijk method is giving the child only one new task at a time. The child does not have to learn a new movement or a new activity; He has to learn that this familiar movement represents the familiar activity. This approach is in accordance with the Piagetian principles of starting with the known and taking small steps so that the new learning can be assimilated into the child's cognitive organization. Here again, it is important that the child acquire many natural gestures before beginning to work at a higher level of representation.

Before natural gestures are blended into real signs, the following conditions should be met:

1) The child should be able to understand and produce a large number of natural gestures, perhaps as many as 20 or 25.

2) The child should be able to express more than just one function or intention through use of natural gestures: he should be able to request an object; request interaction with a person; request that he is allowed to do something; direct the adult's attention to an object or event and thus share information with him. Language is motivated by the expression of physical and social needs: for language to develop, the child must learn what use it can be to him.

3) The child should show sensorimotor stage 6 behaviors indicating that symbolic functioning is occurring. Again, only one new thing should be taught at a time. The child knows that gestures have uses, that they "stand for" things. Now you can begin to lead him to the knowledge that this strange gesture, which doesn't look anything at all like his movements when using the object, can stand for that object and will transmit meaning. It is also only at stage 6 that you should expect the child to be drawing pictures and recognizing that slightly different pictures can represent the same object or event.

The transition from stage 5 to stage 6 is very gradual and no boundary can be pinpointed at which the behavior becomes truly symbolic. By the end of the sensorimotor period, the child has learned the following things:

1) He has learned about his own individual boundaries--that other

people and things exist separately from him.

2) People and objects operate independently of the child, but they can be enlisted to aid him in accomplishing his goals.

3) Certain behaviors can be used to signal wants, obtain attention and assistance from the people around him.

4) An object or person or activity can be referred to through use of a symbol which is abstract and not directly related to the referent.

Piaget and Van Dijk viewed early development from different perspectives, and combining both descriptions results in a much more complete picture of the mechanisms of development. Van Dijk has given a set of specific intervention approaches to aid the developmentally delayed child in developing through the steps covered by the normally-developing child.

For Younger and Severely Handicapped
Teaching Research Integration Project

1 = Consistently demonstra
X/O = Inconsistently demonstrates the ski
0 = Does not display the skill

Student's Name: ______________________

B.D.: ________________ Age: __________

Person Administering Test: ______________

Date of 1st Assessment: __________

Date of 2nd Assessment: __________

Date of 3rd Assessment: __________

AREA I: RESPONSES TO SENSORY/SOCIAL INPUT	Age Appropriate Examples/Context		Dates			Comments/ Examples	Comments/ Examples
Behaviors	Younger	Older Severely/Profound Handicapped					
1. Looks at (fixates on) a familiar person who is gesturing and/or talking (1 mo.)	Looks at Mother, Dad, , Siblings	Looks at caregiver or teacher					
2. Looks at (fixates on) an interesting object (8-12" away) (1 mo.)	Looks at rattle, mobile, stuffed toy in supine position	Looks at food or spoon when in a standing or sitting position					
*3. Quiets or startles when noise is presented (1 mo.)	Door slammed, object dropped (not a familiar noise). Hearing assessment should be completed.						
4. Turns or quiets to person-to-person contact (2 mo.)	Mother touches while crying, child quiets	Calms to touch; smiles to touch					
5. Responds by smiling, quieting, grimacing to taste/smell (0-2 mo.)	When given bottle or nursed	When fed during mealtime or motivating activity					
6. Responds by smiling or quieting when hearing a familiar voice (0-2 mo.) (Prerequisite for #13)	Mother talks to child outside of child's immediate range of vision	Caregiver or teacher talks to student outside of child's immediate range of vision					
*7. Increases/decreases activity level on seeing an interesting object (2 mo.)	Bottle is presented (8-12" away)	Older student's responses may not be highly visible					
8. Tracks interesting objects (that do not make sound) that are moved from side to side (2 mo.)	Objects that do not make noise, i.e. bright yarn, ball, mirror	Spoon with food, caregiver					
9. Visually searches for sound - side to side (2 mo.)	Mother's voice, unfamiliar sound	Familiar voice, unfamiliar sound					
10. Responds in different ways to firm and pleasant voices	Playful voice Firm, louder voice	Pleasant voice, laughing "No, stop"					
11. Responds in a specific way to a person, sound or object in a familiar routine or activity	Quiets or opens mouth seeing bottle	Opens mouth to spoon Quiets upon seeing spoon or cup					

*Behaviors may not be appropriate for older students.

(Continued)

Behaviors	Younger	Handicapped				Examoles	Examples
12. Looks back and forth between two interesting objects (2-3 mo.)	Two objects (toys) that do not make noise, i.e. doll and mobile	Spoon with food, cup, leisure objects					
13. Turns head when unfamiliar sound or a familiar voice is presented and locates sound (4-5 mo.)	Lying down or in a carrier	Turns to telephone ringing or door closing in a standing or sitting position					
14. Participates (does not resist) in a familiar movement when guided through a movement (4 mo.)	Patti-cake, bye-bye, so big, or a motivating activity	Movement with eating, self-help, or motivating activities					
•15. Smiles at a familiar person who is interacting with him/her (4 mo.)	Familiar person kissing or playing with child	During motivational activities with a familiar person					
16. Continues a familiar movement when assisted. Contact is maintained without helping the student complete the movement (3-6 mo.)	Playing patti-cake, waving bye-bye, pushing toy	Opening door, getting paper towel, turning water faucet					
17. Responds in at least two different ways when the adult interacts with the student (4-6 mo.)	Looks at, smiles, reaches, increase activity	Looks at, laughs, pushes away, reaches					
18. Tries to get attention through eye contact, smiling, vocalizing (5-6 mo.)	Tester should interact with student, then look away to test this skill						
19. Begins actions and continues that action when it is imitated by the adult (8 mo.)	Clapping, waving, pounding, lifing arms	Washing hands, rubbing hands, cutting with knife					
20. Imitates actions modeled by an adult. Student can see his own actions. Student can already do these actions independently (6-9 mo.)	Clapping, waving, patting	Washing hands, stirring, turning, cutting					
21. Anticipates and demonstrates the next action in a series of actions in a routine activity (6-9 mo.)	Holds out leg or arm in dressing	Reaches to pull up pants after bathroom. Reaches for a spoon after given a bowl					
22. Imitates new actions. Student can see his own actions. These are actions that the student cannot do independently.	Waving, patting (child can see his own action)	Pouring, turning knob, opening jar					
23. Imitates new actions that the student cannot see himself perform	Peek-a-boo, shaking head, point to nose	Nodding, kleenex to nose, combing hair without mirror					

AREA 11: INTERACTIONS WITH OBJECTS

	Age Appropriate						
Behaviors	Younger	Older Severely/Profound Handicapped				Comments/ Examples	Examples
1. Repeats actions on objects that cause an interesting result (2-3 mo.)	Kicks feet/ bats at ball or mobile to activate it again	Repeats movements that activate any object (contingency awareness)					
2. Maintains grasp on object for at least 10 seconds when object is placed in student's hand (2-3 mo.)	Rattle, cloth animal	Food item, tactile object					
*3. Mouths objects placed in hand (2-3 mo.)	Rattle, cloth, keys - (0-6 mo. for developmentally delayed)	Decrease if this occurs					
4. Looks at object placed in hand (3 mo.)	Rattle, cloth animal, keys, brightly colored items	Attends to objects being held or when object is presented					
5. Reaches for object (3-5 mo.)	Reaches for bottle, rattle, or keys	Reaches for cup, food item, coat, or interesting item					
6. Continue to look for preferred object when it is removed and the student can no longer see it (4 mo.)	Bottle, covered toy moved from view (child is seated)	Food item placed in container, object in box, spoon under napkin					
*7. Shakes/bangs objects placed in his/her hand (3-4 mo.)	Rattle, keys, noisemaker	Decrease banging, increase other functional actions on objects					
8. Reaches, takes an object presented by an adult and holds object for 5 or more seconds (4-5 mo.)	Takes keys, object to mouth	Takes edible, cup, towel, vocational item					
9. Demonstrates four or more simple actions on objects (4-5 mo.)	Bangs, waves, hits, pulls, flips, (drops, throws, 6-7 mo.)	Push, turn, pull, put in (with age appropriate and functional objects)					
10. Reaches out and takes an object that is partially hidden from his/her view. Student watches as object is partially hidden (5-6 mo.)	Bottle half covered by a pillow/cloth, doll behind a box	Spoon partially covered by a container or napkin					
11. Reaches out and takes objects that are completely hidden from his/her view. Student watches while the object is hidden (8-9 mo.)	Finds toy under a blanket or behind another object	Finds toothbrush in a tub or glass					
12. Explores new objects by looking closely at them or feeling them (7 mo.)	Turns over, feels, mouths	Turns over, smells, feels					
13. Drops/places or tranfers one or both objects to take a third object (7 mo. drops/9 mo. places) (has two objects in hands)	Drops rattle and/or block to reach for keys	Puts down cup and celery to reach for dessert					
14. Demonstrates two or more complex actions with objects (other than bang, hit, push, pull, shake) (9 mo.)	Pokes, squeezes, tears, turns, dumps	Turns door knob, pulls paper towel, puts towel in trash					

Responses	Younger	Handicapped				Examples	Examples
15. Imitates an action on an object when only one object is present. Student can already do actions (6-9 mo.)	Pushes car, turns toy, hits drum, shakes toy, rolls ball	Pushes grocery cart, turns on radio, opens jar					
16. Uses one object to act on a second object (10 mo.)	Hits pan with spoon, puts object in a container	Puts objects in a container, puts plate in sink, throws napkin in trash can					
17. Demonstrates the functions of objects when they are presented out of the usual activity (9-10 mo.)	Drinks from cup, (no liquid), wipes mouth with napkin, combs hair	Demonstrates functions of a wide range of objects in context					
18. Uses at least 10 objects appropriately (10-15 mo.)	Opens book, uses kleenex, stacks rings, pushes car, rolls ball	Opens milk, uses kleenex, uses toothbrush, uses spoon, stirs, combs hair					
19. Identifies familiar objects that go together based on their function (15+ mo.)	Gives cup when juice can is held up, gets spoon when yogurt is presented	Pours cereal in bowl instead of cup; sees socks gets shoes; sees bus, gets coat					
20. Matches identical objects from two distractors (18+ mo.)	Apple to apple/cup to cup, matching toys on shelf	Use functional objects sorts silverware, sorts paper, places clothing items together					

Behaviors	Younger	Handicapped				Examples	Examples
1. Demonstrates reflexive sound making (crying, fussing, throat sounds)	Throat sounds simillar to ga/ka sounds	May not observe					
2. Demonstrates differentiated cries (1-4 mo.)	Different cries for hunger/pain	Different vocalization for hunger/displeasure					
3. Demonstrates interactive sound making; cooing laughter (2-5 mo.)	Squealing "o", "u", "gu" (typically back closures)	Vocalizes pleasure					
4. Vocalizes in response to a person talking (3 -5 mo.)	Soothing vocalization during play with an adult	During an interaction or motivational activity with another person					
5. Uses at least two vowels and two consonant sounds in vocal play and/or to communicate (3 -5 mo.)	"a, g, n, h, k, u, m, o"						
6. Repeats vocalizations that get reactions (4-5 mo.)	Child vocalizes - Mom claps or acts surprised	Vocalizations that are reinforced					
7. Vocalizes sounds with different pitch, loudness and draws sound out (4-6 mo.)	Pleasurable, emphatic	Uses for communication, pleasure, upset					
*8. Student initiates sound - adult imitates - student repeats (4-6 mo.)	Child says "a"; adult says "a"; child says "a"	May not be appropriate - may imitate intonation					
9. Uses at least three sounds made at front of the mouth (4-6 mo.)	Such as "b, p, m, n, l"						
*10. Produces at least five different babbling combinations in which combinations are repetitive (7-10 mo.)	agaga, baba, nanana, mama, dada	May not be appropriate					
*11. Student begins vocal interactions - adult imitates the student's sound then uses a new sound that the student can make. Student imitates.	*S=baba, A=baba, S=baba, A=gaga, S=gaga	May not be appropriate					
*12. Imitates sounds that he/she can already make when the adult initiates the sounds (10-12 mo.)	*A=baba, baba, S=baba	May not be appropriate					
*13. Produces at least five different babbling combinations in which combinations are nonrepetitive (11-12 mo.)	baga, dobi, gadu	May not be appropriate					
14. Imitates word approximations containing two syllables that student already attempts to say syllables repeat (14 mo.)	Mama, nana (night-night) baba (bottle)	Wawa (for water) kaka (for cracker)					
15. Imitates one syllable word approximations that the student can already make (12-14 mo.)	Da (for dog), gi (for give), ma (for more)	due (for juice), ju (for juice), e (for eat), es (for cheese)					

*NOTE: S=student A=adult

Behaviors	Younger	Handicapped				Examples	Examples
16. Imitates words containing two syllables that are repetitive and simple consonant-vowel-consonant-vowel words that the student cannot already make-new words	Cookie, cracker, bubble	Cookie, paper					
17. Imitates sounds that student cannot already make - new sounds	"t" "k" "s"	"s" "th" "sh"					
18. Imitates words containing two syllables (syllables are not repetitive) that the student cannot already make	balloon, yogurt, carrot, peanuts	outside, butter, money, sandwich					

AREA III:B: ORAL-MOTOR DEVELOPMENT Behaviors	Age Appropriate Examples/Context Younger	Age Appropriate Examples/Context Older Severely/Profound Handicapped	Dates			Comments/ Examples	Comments/ Examples
1. Rooting, swallowing reflexes are present (2 mo.)	Begins sucking response when touched near mouth	Biting and swallowing are used in eating					
2. Demonstrates efficient suck/swallow pattern (5-6 mo.)	(Obtain OT/PT input)	(Obtain OT/PT input)					
3. Uses upper lip to scoop food from spoon (7-8 mo.)	Baby food	Yogurt, pudding, potatoes					
4. Uses tongue to help chew textured foods prior to swallowing	Cereal, cracker, apple, cheese	Attempts to chew prior to swallowing					

Behaviors	Younger	Handicapped				Examples	Examples
1. Responds to own name by ceasing activity, blinking (3-4 mo.)	May not be responding to the specific name but the "calling" intonation.						
2. Responds to environmental cues that are part of an activity.	Opens mouth when spoon or cup touches lips. Responds when tray is taken off wheelchair						
3. Responds to firm voice (no, stop it, don't) (4-6 mo.)	May hesitate; does not necessarily cease activity Note: This is not assessing compliance.						
4. Holds up hands to be picked up when gesture and verbal cue are presented. Student is motivated to get up/out (4-6 mo.)	Mom claps, holds out hands and says, "up"	Holds out hand to go with another person (as in transition or leaving)					
5. Responds to five functional touch cues or tactile prompts.	Eat, sit, stand, give me, stop						
6. Turns to his/her name being called or stops activity (5-6 mo.)	In a situation where there is a reason to turn and to expect something						
7. Responds to "come here" when adult uses a verbal and a gesture cue (8-9 mo.)	Crawls to adult when adult holds out hand & says, "Come here"	Walks/moves wheelchair to adult					
8. Ceases activity to "no, stop it, don't"(8-9 mo.)	When child reaches for a dangerous or breakable object	Student understands and ceases activity to "no, don't"					
9. Follows a "look" cue when the adult points to a familiar person moving and/or talking. (9-11 mo.)	Mom points to dad or to the dog	Teacher points to the aide or a peer					
10. Responds to 3 or more simple directions when gesture cues are also used (8-10 mo.)	Sit down, pick up, pull down, look here	In age appropriate contexts, go _____, get _____, put away _____					
11. Responds to 5 or more simple directions when gesture cues are also used	Go, all gone, up, down, no, look, pick-up, mine	Finish, go, sit, no, pick-up, take-off, play, work, give me					
12. Demonstrates 3 or more actions that he/she can already do when only a verbal cue is used (9 mo.)	Bye-bye, patti-cake, peek-a-boo	Get money, get coat, put away (object), open (object)					
13. Looks at object or person when a verbal and a pointing cue are used (10-12 mo.)	Make sure there is a reason to look (person is not talking or moving). Looks at caregiver or teacher						
14. Gets object (out of sight) when adult uses verbal and gesture cues. Gesture serves as a representation of object that is not visible (11-12 mo.)	Get your "truck" with pushing motion	Where's your screwdriver (gesture provided), get your cup (gesture drink)					
15. Gives an object to adult when adult uses verbal and gesture cues. Student complies and gives object when 2 distractors are presented (11-12 mo.)	Get me car, toy, cup	Give me the papers, money, forks					

A. IV: RECEPTIVE COMMUNICATION (Continued)

Behaviors	Younger	Older Severely/Profound Handicapped				Examples	Examples
16. Responds to the verbal cue "look", when only the verbal cue is used (11-12 mo.)	Make sure there is a reason to look						
17. Identifies 3 or more objects to an associated object and verbal cue	Gets cup when milk is presented; gets shoe when parent gets out other clothes	Picks up cup (not bowl) when juice is presented					
18. Responds to own name (vs. other names). Student has to discriminate his name from others (12-16 mo.)	Call child's/student's name when there is more than one person in room. Call another person in room - child/student does not respond						
19. Identifies (by a motor response) 2 or more familiar persons when named (16 mo.)	Mom, Dad, Sister	Mother, teacher's name, sister/peer					
20. Follows 3 or more one-concept directions w/o gestures but in context (8-12 mo.)	Come, sit down, stop that	Come here, wait, get it, give it to me					
21. Identifies 5 body parts (18+ mo.)	Mouth, eye, nose, tummy hair	Only those related to age-appropriate activities and terms					
22. Identifies 5 or more familiar objects to the verbal or sign cue (with 2 distractors) (14-22 mo.)	Rattle, dog, ball, bubbles, shoe, cracker	Coat, money, toothbrush, bus					
23. Follows 5 or more one-concept directions w/o gestures but in context	Give it to me, get it, wait, put it here, pick it up, turn it, put it down						
24. Gets (or looks in the direction of) objects that are out of sight when adult uses verbal or sign cue only (16-24 mo.)	Milk in refrigerator, crackers in cupboard, shoes in room	Toothbrush in drawer, money in desk/envelope					
25. Follows 10 or more one-concept directions w/o gestures but in context	Wash hands, open ________, close ________, put away ________						
26. Identifies 10 or more common objects to a verbal or sign cue with 3 distractors	Spoon, coat, truck, soap book	Soap, fork, work, sandwich, kleenex					
27. Identifies 20 or more common objects to a verbal or sign cue with 3 distractors	Milk, paper, apple, cup, kleenex	Medicine, shirt, napkin, cake, plate, radio					
28. Demonstrates or identifies 5 or more action verbs when other actions are available within the same context	(Eat cheese - cut cheese) (pour juice - drink juice) (get bus - push bus)	(get paper - throw away paper) (cut bread - take out bread) (put on bolt - turn bolt)					

Behaviors	Younger	Handicapped				Examples	Examples
29. Responds to at least 3 types of 2 word combinations that represent early relationships. Record specific combinations, items a to e	Situations must be arranged so that the student demonstrates understanding of individual words						
a. Verb - Noun (state - object)	Want cookie, love you, need paper, see ______ hear _____						
b. Verb - noun (action - object)	(eat cookie, get cookie, eat cheese) (drink juice, pour juice, drink milk) (get cup, wash cup, get bowl)						
c. Verb - noun (action - location)	(go outside, play outside, go home) (put-on chair, sit chair, put-on table)						
d. Adjective - noun (reoccurrence - object)	(more juice, more cookie, no more), (more work, more money, no work)						
e. Adjective - noun (feature - object)	(big cracker, little cracker), (dirty table, dirty mouth, clean table), (new coat, new shoes, old hat)						
f. Noun - verb (agent - action)	(Mama look, Daddy look, Mama help) (Sue come, Jamie come, Sue work)						
g. Negation	(no cookie, no cup, no want) (No play, no sit) (Juice all gone) (Not here)						
h. Possessive - object (should be student's and trainer's own possessions)	(my coat, your coat, my shoe) (my nose, your nose, my foot) (my Mom, your Mom, my sis)						
i. Demonstrative - object or location	(that mine, this mine, that yours) (it here, this here, it gone)						
j. Location	(book here, book there, paper here) (over here, right there, right here)						
k. Conjunction	(shoe-sock, cup-spoon, bread-butter, Mom-Dad)						
30. Responds to 3 or more simple, two concept directions in context (20+ mo.)	Get your book and take it to Daddy	Get your coat and go to the bus					
31. Responds to 10 or more two-concept directions in context (26+ mo.)	Get your bear and put it away	Pick up your plate and put it in the sink					

(Refer to Appendix A for references for higher level assessments.)

AREA V: XPRESSIVE COMMUNICATION
A - Prelanguage

Behaviors	Age Appropriate Ex s/Context		Dates			Comments/ Examples	Comments/ Examples
	Younger	Older Severely/Profound Handicapped					
1. Uses a simple signal go get adult to repeat an activity (3-5 mo.)	Wave hands to get more of an interaction, generalized body movement or facial gestures	Rocks to get "more" food or shows excitement to get adult to continue activity					
2. Uses a simple signal to get adult to start a routine activity (3-6 mo.)	Activities that have been used previously (as in #1 above)						
3. Pushes away objects or adult to indicate protest (4-6 mo.)	Pushes away a nonpreferred food item or adult's hand						
4. Touches object or touches adult to get "more" of an action or object (8 mo.)	Takes adult's hand to get "more patti-cake"	Touches and assists: to get "more coffee"					
5. Initiates holding up hands to be picked up (7-8 mo.)	Or out of high chair	Holds out hand to "go with"					
6. Reaches toward or touches object to indicate "get it/give it" (7-9 mo.)	Or looks or orients toward adult and looks at motivational object						
7. Indicates desire to get down (7-9 mo.)	Looks at adult/squirms	Desire to leave - walks to door, fidgets					
8. Manipulates adult to request "more" for 3 or more objects/activities (7-10 mo.)	Tickle, toy activation, bottle, food	Vibrator, light, drink					
9. Manipulates adult to request 5 or more objects/activities (10-12 mo.)	Food items, spoon, interactions	To go outside, to get container opened					
10. Gives at least 3 objects to an adult to request "more" when adult uses gesture cues (9-10 mo.)	Gives closed container with cereal to adult so adult will open it	Gives cup to get more "juice"					
11. Gives at least 3 different objects to adult to request when adult uses gesture cue (9-12 mo.). This is not requesting more.	Container with food, toy, cloth for peek-a-boo, bubble car, lotion bottle	Cup, bowl, lotion, closed container					
12. Gives at least 5 objects to adult to request without a gesture cue. Student initiates the interaction (10-13 mo.)	Gives small toy to be activated, holds up foot for "tie shoe"	Holds out cup for more coke or coffee					
13. Touches 1 of 2 objects to request choice	Cracker, yogurt, juice, milk, 2 toys	May be objects that represent activities - eat/swim					
14. Looks at object, at person, back at object, to person to request or get attention to the object/activity	Notices object out of reach, gets adults attention at object to direct adults attention to the object, looks back at the adult to communicate	This skill may replace other prelanguage skills for the motor impaired student					

EA V: EXPRESSIVE COMMUNICATION (Continued)

A - Prelanguage

Behaviors	Younger	Older Severely/Profound Handicapped				Comments/ Examples	Comments/ Examples
15. Waves bye/hi to greet in response to others waving	Waves hi/bye	Waves or shakes hands					
16. Extends hand (palm up) to request an object (10-14 mo.)	To get lotion, to get cereal	To get fork, to get spoon, to get money					
17. Shakes head for no (8-12 mo.)	To indicate dislike, rejection, protest						
18. Nods head for yes (12 mo.)	To indicate preference, or likes						
19. Pulls/tugs at adult for adult to get object that is out of sight (10-12 mo.)	To get book, to get milk from refrigerator	To get coat from closet, to get paper from top shelf					
20. Initiates waving bye/hi to greet (10-12 mo.)	In appropriate situations only	Shakes hands or waves when appropriate					
21. Pairs at least one prelanguage response with vocalizations	Holds out cup and vocalizes if not immediately responded to	Shakes or nods head and vocalizes, points and vocalizes					
22. Points to an object to request the adult to get id (10-12 mo.)	Points to desired food items, toy or object	Points to coat, object out of reach					
23. Uses 3 or more different simple gestures to communicate (12 mo.)	Hi/bye, shakes head, nods head, gesture come, gesture mine, gesture "put it here/give it to me"						
24. Uses vocalizations to get attention and initiates a second communicative behavior	Calls you, then requests help, calls you then points to an object						
25. Combines atleast 3 prelanguage response with vocalizations (11-15 mo.)	Pushes adult's hand toward object and vocalizes; Extends cup for "more" juice and vocalizes, Points to a food item and vocalizes						
26. Points to another person or an object to get adult to look at object (12-15 mo.)	Points to light, animal Points when Dad comes in door	Points to bus pulling up, new person in room					
27. Taps you/holds up hand to get your attention (12-15 mo.)	Taps or tugs on adults to get their attention	In vocational setting, may raise hand - or reach to touch adult walking by					
28. Shows you an object to get you to comment (15 mo.)	Holds up toy to show you, holds up book to show adult	Points to new piece of clothing to get adult to look					
29. Uses 5 or more gestures to communicate	Hi/bye, shakes head, nods head, gesture come, gesture mine, gestures "put it here/give it to me"						
30. Requests objects out of sight by using gestures/pointing (16-18 mo.)	Points to foot for shoe	Gestures hat, screwdriver					

Language Behaviors	Younger	Handicapped				Examples	Examples
NOTE: If a student is not pairing prelanguage responses with vocalizations or if the student is older and is not using speech for communication, assess the student for an augmentative communication system. The goal is that the student's language mode is intelligible to a listener in order for effective communication to occur.							
31. Uses speech, signs or communication board to request two or more objects or actions (12-28 mo.)	"dada" used only for Dad, "baba" for bottle	Signs "apple" for apple; cracker for "cracker"					
32. Uses five or more words (speech, sign, communication board) to request an object or action	More, book, bubble, cracker, drink	More, finish, work, drink, eat					
33. Uses five or more words to name or to refer to objects	Says names of objects for attention to confirm or to get adult to comment						
34. Uses ten or more words to request (speech, sign, communication board)	Names the item when wanting that particular item						
35. Uses twenty new words for different types of relations to request or label (speech, sign, communication board)	Words or signs must be clear enough to be understood by people familiar with student; may include nouns, verbes, adjectives						
a. Existence: words that express that a person or object is noticed or observed	"Mama", "Mary", "there" "here", "that", "hi"	"Dan" (for there's Dan) hi, there, that					
b. Non-existence/disappearance/rejection: words that express that the object or person is gone or the activity is finished	"No", "All gone"	"Gone", "finish", "done"					
c. Reoccurrence: words that express that the action should occur again or that more of an object is requested	More; again	More; again					
d. State verb: uses two verbs that express an emotion or a feeling	"Sleepy", "love", "hurt", "want", "need"	"Mad", "love", sick" "hurt", "want", "need", "like"					
e. Action verb: Uses at least five verbs that express an action	"Come", "get", "eat", "go", "look"	"Eat", "drink", "get"					
f. Names: Names of familiar persons	"Mom", "Dad", "sister"	Teacher's name, peer's name					
g. Adjectives or Adverbs: features of objects, persons or actions	"Dirty", "new", "pretty" "now", "big"	"Fast", "later", "good"					

For higher functioning students, see Communication Training Program, DLM Teaching Resource, Austin, Texas

dent is using prelanguage or language. This area shows how a student is using his/her communication. (Sign, speech, communication board). Uses at least two words to:

Behaviors	Younger	Handicapped				Examples	Examples
1. Protest or reject - student lets you know when he/she doesn't like something	No, stop	No, don't, stop					
2. Request objects	Cracker (give me), bottle (give me)	Coffee (give me) paper (give me)					
3. Request action	Up (pick me up) look (look there)	Come (come here)					
4. Name objects for attention, confirmation or makes a statement or comment	Dog (there's dog) bottle (I have) sick (I'm sick)	Bus (there's bus) finish (I'm finished)					
5. Call someone	Uses name "Mama" to get attention	Uses name "Nancy" to get attention					
6. Offer	Hands toy to peer to play with, shares cracker, gives adult a turn	passes plate to peer, takes turns					
7. Repeat	"We have apples" repeats, apple	"You need your money" repeats, money					
8. Request permission	Outside (can I go outside)	Bathroom (I'm going to bathroom)					
9. Ask questions	Tha? (what's that)	Coat? (Where's my coat?)					
10. Answer questions	Where are you going? "outside"	What do you need? "napkin"					
11. Eighty percent of one-word utterances are understood by new people (speech, communication board, sign) if used in a familiar context	Student uses most final sounds in words and the majority of consonants are correct.						
12. Spontaneously initiates prelanguage/language between 40-60% of the time	Make sure opportunities are given to allow initiation						
13. Uses a variety of prelanguage responses or one and two-word utterances to express communication functions (#1-10 above)	May be prelanguage or language						
14. Environment provides opportunities for communication*	May be prelanguage or language						
15. Environment positively consequates communication*	May be prelanguage. Student is naturally reinforced for trying to communicate.						

(*Intervention will involve persons in the environment.)

AREA VI COMMUNICATION FUNCTIONS (Continued)	Age Appropriate Ex[illegible]es/Context		[illegible]				
Behaviors	Younger	Older Severely/Profound Handicapped				Comments/ Examples	Comments/ Examples
16. Environment expands student's prelanguage to language or expands to higher language levels*	Child points to balloon, Mom says "that's balloon	Students signs money teacher signs, "get money"					
17. Environment demands that the student use language in place of prelanguage across at least two nontraining settings*	For those students who have a formal language system (speech, signs or a communication board)						

*Intervention will involve persons in the environment.

Name ____________________

Teacher ____________________

2) Date ____ Color ☐ 4) Date ____ Color ☐

COMMUNICATION PLACEMENT ASSESSMENT PROFILE

	I. Responses to Sensory/Social Input	II. Interaction with Objects	III. Vocal Development	IV. Receptive Communication		V. Expressive Communication	
				0-12 mos.	12+ mos.	A. Prelanguage	A. Prelanguag B. Language
3 months	1 Looks at familiar person 2 Looks at object 3 Reacts to noise 4 Reacts to contact 5 Reacts to taste /smell 6 Reacts to familiar voice 7 Changes activity level 8 Tracks side to side 9 Searches for sound 10 Responds to different voice tones	1 Repeats actions on objects 2 Maintains grasp on objects placed in hand 3 Mouths objects 4 Looks at objects placed in hand	1 Demonstrates reflexive sound making 2 Demonstrate differentiated cries 3 Demonstrates interactive sound making		18 Responds to own name 19 Identifies 2+ familiar persons 20 Follows 3+ directions w/o gesture 21 Identifies body parts 22 Identifies 5+ familiar objects 23 Follows 5+ directions w/o gestures 24 Gets object out of sight		23 Uses 3+ gestures 24 Vocals to get attention 25 Pairs 3+ gestures 26 Points object to "show" 27 Taps/hold up hand to get attention 28 Shows object for comment 29 Uses 5+ gestures 30 Requests objects out of sight using gestures
6 months	11 Responds to obj/person/sound in familiar routine 12 Looks at objects 13 Turns toward sounds/voices 14 Participates in a familiar movement 15 Smiles at familiar person 16 Continues movement when assisted 17 Responds to different ways to interaction	5 Reaches for object. Object and hand seen 6 Continues to search for removed obj. 7 Shakes and hangs obj. placed in hand 8 Reaches and holds objects (5 sec.) 9 Demonstrates four simple actions or objects 10 Reaches and takes partially hidden object	4 Vocalizes in a response to a person talking 5 Uses two vowels, two consonants in vocal play/ or communication 6 Repeats vocalizations to gain reactions 7 Vocalizes sounds with different pitch/loudness 8 Initiates verbal play with adult 9 Uses 3+ sound "b, p, m, n, l"	1 Responds to name by blinking/ ceasing activity 2 Responds to environmental cues 3 Responds to firm voice 4 Holds up/out hands 5 Responds to 5+ functional touch cues 6 Turns to own name being called	25 Follows 10+ directions w/o gestures 26 Identifies 10+ obj. when given name or sign (3 distractors) 27 Identifies 20+ obj. when given name or sign (3 distractors) 28 Demo/Identify 5+ action verbs 29 Shows understanding thru responses of 3 or more types with the following two word combinations	1 Uses simple signals to have adults repeat 3+ activities center #1 2 Uses simple signal to have adults start a routine activity 3 Pushes away to protest/reject	B. LANGUAGE 31 Requests 2+ obj./actions 32 Requests 5+ obj./action 33 Names 5+ obj. 34 Uses 10+ word to request 35 Uses 20+ word to request or label
9 months	18 Tries to get attention by . smiling . eye contact . vocalization 19 Turn taking activity 20 Imitates action modeled by adult 21 Anticipates and does next action in a routine	11 Takes hidden object 12 Explores new object 13 Picks up third object 14 Demonstrates 2+ complex actions on obj. 15 Imitates action on object	10 Produces 5+ babbling combinations (repetitive) 11 Student begins vocal interaction. Adult imitates then starts new sound. Student imitates	7 Responds to "come here" with gesture 8 Ceases activity 9 Follows look cue 10 Follows 3+ simple directions 11 Follows 5+ simple directions 12 Demonstrates 3+ actions	a Understands state-obj. b Understands action - obj. c Understands action - location d Understands reoccurance/obj. e Understands feature - obj. f Understands agent - action g Understands negation	4 Touches or assists adult to request more (2+) 5 Initiates "up" or "go with" 6 Reaches/touches to request 7 Indicates "I want down" 8 Manipulate adult to request more 3+ 9 Manipulate adult to request more 10 Gives object to request more	a Uses "Exist words b Uses "Non-Existence" wor c Uses "Reoccurence words d Uses 2+ verbs feeling/emotio e Uses 5+ verbs action f Uses names g Uses adjective /adverbs
	22 Imitates new actions. Student can see his own action 23 Imitates new actions. Student can not see his own actions	16 Uses one obj. to act on 2nd obj. 17 Demonstrates function of obj. 18 Uses 10+ objects appropriately 19 Identifies object that go together 20 Matches identical obj.	12 Initiates sounds. Adult imitates 13 Produces 5+ babbling combinations (nonrepetitive) 14 Imitates word approximation syllables repeat 15 Imitates one syllable word approximations 16 Imitates two syllable words repetitive consonant 17 Imitates new sounds 18 Imitates new two syllable words	13 Looks at obj. /person 14 Gets obj. out of sight (gesture cue) 15 Gives obj. (gesture one) 16 Responds to "look" (verbal cue only) 17 Identifies 3+ familiar obj. (verbal cue)	h Understands possessive i Understands demo - obj. j Understands location k Understands conjunction l Understands feature - obj. 30 Follows 3+ 2-concept directions in content 31 Follows 10+ 2-concept directions	11 Gives 3+ obj. to request 12 Gives 5+ obj. to (w/o gesture) 13 Use touch to request 14 Uses gaze to request 15 Waves bye/hi 16 Extends hand to request 17 Shakes head 18 Nods head 19 Pulls/tugs at adult to request 20 Imitates waving hi/bye 21 Pairs prelanguage with vocal 22 Points to request	

ICS, Helmstetter, et al, 1984,

	Skills to be Taught							
(Activity) Time ____ (location) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								
Time ____ ( ) Ratio____								

Individualized Curriculum Sequence and Expanded Classroom Model for Learners Who Are Deaf and Blind

	Skills to be Taught										
Activity Time ___ (Location) Ratio ___	Toilet Regulation	Decrease Screams	Strengthen Arms	Respond to Gesture	Signals for Needs	Waits Turn	1-1 Correspondence	Pincer Grasp	Use Tape Recorder	Wash Hands	Stop at Crosswalk
Arrival at School Time 8:30 (Bus) Ratio 1:4		Implement behavioral program	Open/close bus door; wheel to class, locker; open door; release seat belt; lift school bag	Come; give me; point to: name card, bag, book, to hang bag	For help with seat belt, door	To exit bus, enter building, enter classroom, to go to locker	Place coat, hat, & bag on hooks; name cards in holders	Lock on bus; coat loop; name card	As reinforcer	After using wheelchair	From bus to classroom
Toileting Time 8:45 (Bathroom) Ratio 1:4	X	▪	Wheel to: bathroom, sink; open doors; transfer; flush toilet	Come; Point to bathroom, transfer board	For help with door; transfer board (T-board); soap, towel, toilet paper	To go to bathroom, sink	Soap on dish, towel & washcloth on hooks	Pants zipper, toilet paper	As reinforcer	After toileting	
Vocational Group Time 9:15 (Voc Area) Ratio 2:8		▪	Wheel to work area, carry or push materials, transfer	Come; point to chair, T-board; give by peer	For work materials, T-board, done	To enter work area, for materials	Silverware setting, pots on hooks, reinforcer to each	Fork, spoon, knife, reinforcer	As reinforcer		
Break Time 10:00 (Leisure Area) Ratio 2:8		▪	Transfers, wheels to area	Come; point to area, chair, glass, napkin, student, pitcher	T-board; more napkins, glasses, tape recorder	For snack, to go to area	Give each S a glass, straw, napkin, cookie	Straw, napkin, cookie, cassette tape	As leisure activity		
Depart for Group Home Time 10:15 (Bus) Ratio 1:3		▪	Wheel to bus, locker; open door, bus lock, seat belt; transfer	Come; point to T-board, name card, coat, hat, seat belt, lock	T-board; for help with door, lock, seat belt, coat, hat	To go to bus, locker; to enter bus	Sign out each student	Name card	As reinforcer		From class to bus
Arrival at Group Home Time 10:30 (Bus) Ratio 1:3		▪	Open/close bus door; wheel to building; open door	Come; point to walk light	For help with seat belt, door, lock	To disembark from bus, to enter building		Lock on bus; coat loop	As reinforcer		From bus to building
Toileting Time 10:45 (Bathroom) Ratio 1:3	(Same as Toileting at 8:45)										
Prepare for Lunch Time 11:00 (Dining Area) Ratio 1:3		▪	Wheel to area, transfer	Come; point to placemat, glasses, napkins, silverware, plates	For more placemats, glasses, etc.	To enter area	Give each S 1 placemat, glass, etc.	Napkins, silverware, straws	As reinforcer	Before lunch	

Figure 4.9. The completed matrix for Gerard. Underlined materials and events are those to be used to teach the skill or task.

Activity (Location)	Time ___ Ratio ___	Toilet Regulation	Decrease Screams	Strengthen Arms	Respond to Gesture	Signals for Needs	Waits Turn	1-1 Correspondence	Placer Grasp	Use Tape Recorder	Wash Hands	Stop at Crosswal
Lunch (Dining Area)	Time 11:30 Ratio 1:3		*	Wheel to area, transfer	Come; point to chair; reach for food by peer	For T-board, more food	To enter area, for food, to begin eating		Napkin, bread or other finger foods			
Cleanup (Kitchen	Time 12:00 Ratio 1:3		*	Wheel to kitchen, transfer, carry plates	Come; give me by peer at dishwasher	For T-board, for help with carrying plates, etc.	To be excused from table	One plate per place in dishwasher	Straws, silverware	As reinforcer		
Depart for Store (Door)	Time 12:30 Ratio 1:3		*	Wheel to bus, open door, bus lock, close seat belt, transfer	Come; point to T-board, coat, hat, seat belt, lock	T-board; for help with door, lock, seat belt, coat, hat	To go to bus, to enter bus			As reinforcer		From building to bus
Arrival at Store (Bus)	Time 12:45 Ratio 1:3		(Same as Arrival at Group Home at 10:30)									
Leisure (Arcade)	Time 1:00 Ratio 1:3		*	Wheel to arcade room	Come; point to game, coin slot	For wallet, coins	To play game	1 coin in each slot	Coin flap on wallet, coins			
Depart Store (Door)	Time 1:30 Ratio 1:3		(Same as Depart for Store at 12:30)									
Arrival at School (Bus)	Time 2:00 Ratio 1:3		*	Close bus door; Wheel to class, locker; open door, seat belt	Come; Point to name card	For help with seat belt, door, lock	To exit bus; to enter building, classroom; to go to locker	Place coat & hat on hooks; name cards	Lock on bus, name card, coat loop	As reinforcer	After using wheelchair	From bus to classroom
Toileting (Bathroom)	Time 2:10 Ratio 1:4		(Same as Toileting at 8:45)									
Depart for Home (Door)	Time 2:25 Ratio 1:4		*	Wheel to bus, locker; transfer; open door, bus lock; lock seat belt	Come; point to T-board, book, bag, where to hang bag; name card	For T-board; for help with door, lock, seat belt	To go to bus, locker; to enter bus	Sign out each student	Name card	As reinforcer		From classroom to bus

Figure 4.9. (Cont'd)

		Skills to be Taught								
Activity (Location)	Time ____ Ratio ____	Strengthen Neck Muscles	Indicate Pleasure/ Displeasure	Segment at Waist	Toilet Regulation	Decrease Tongue Thrust	Reach 10 Inches from Chest	ROM of Ankles, Legs, and Hips	Quieten to Sound	Decrease Drooling
Arrival (Bus)	Time 8:15 Ratio 1:3	Head up sitting on mat, in chair	Pat arm for hello, when push in chair, when hold hand	Twist in chair, cross midline	Pants check	With food reinforcer	To touch teacher, for reinforcer, to remove coat		Bus, name, to other students	Lip closure & facilitate swallowing
Toileting (Bathroom)	Time 8:30 Ratio 1:3	Head up on toilet, for pull to sit, in sidesit	At being wet, when held	Roll, cross midline, come to sidesit	X	•	Pants, to touch teacher, toilet paper, reinforcer	When removing clothing, rolling	Call of name, toy to roll to	• -
Cleanup/ Dressing (Bathroom)	Time 9:00 Ratio 1:4	Lower to supine, for pull to sit, in sidesit	At being dry, when held	Roll for dressing, come to sidesit		•	To touch mat or pants	When dressing after toileting		• -
Group 1 (Table)	Time 9:15 Ratio 1:4	In sidesit, in sitting, for pull to sit	For: reinforcer, toy, tape recorder	Roll, in sidesit, to cross midline	Pants check	•	Activate toy or tape recorder, for reinforcer, for teacher	During rolling	Call of name, toy to roll to, to music	• -
Group 2 (Mat)	Time 9:45 Ratio 1:4	In prone prop, for pull to sit, in sidesit	For: reinforcer, toy	Roll, in sidesit, to cross midline	Pants check	•	Activate toy or tape recorder, for teacher	During rolling	Call of name, to sound of toy	• -
Break (Dining Area)	Time 10:45 Ratio 1:3	In sidesit, in sitting, for pull to sit	For snack items	Roll, in sidesit, to cross midline	Pants check	With food items	For cookie, drink, napkin; for teacher	During rolling	Call of name, to spoon banging on glass, to noise of food wrappers	• -
Toileting (Bathroom)	Time 10:30 Ratio 1:3		(Same as Toileting at 8:30)							
Cleanup/ Dressing (Bathroom)	Time 11:00 Ratio 1:3		(Same as Cleanup/Dressing at 9:00)							
Group 3 (Table)	Time 11:15 Ratio 1:3		(Same as Group 1 at 9:15)							
Lunch (Lunch Room	Time 11:45 Ratio 1:2	Head up before bites, for pull to sit, in sidesit	Food, drink	Roll, in sidesit, to cross midline	Pants check	With lunch	Cup, spoon, napkin, finger foods		Call of name, to lunch bell, lunchroom noise	• -
Toileting (Bathroom)	Time 12:45 Ratio 1:3		(Same as Toileting at 8:30)							
Cleanup/ Dressing (Bathroom)	Time 1:15 Ratio 1:3		(Same as CleanUp/Dressing at 9:00)							
Group 4 (Mat)	Time 1:30 Ratio 1:4		(Same as Group 2 at 9:45)							
Departure (Bus)	Time 2:15 Ratio 1:3	Head up coat on, in chair, in sidesit	Pat arm for goodbye, when pushed in chair, when hand held	Roll, in sidesit, to cross midline	Pants check	With food reinforcer	For teacher during goodbye, for coat on, for reinforcer	During rolling	Call of name, dismissal bell, to bus, other students	• -

Figure 4.10. The completed matrix for Theresa. Underlined materials and events are those selected for teaching the skill or task.

Vestibular Stimulation: Contingent and Noncontingent Applications with Persons Having Severe Handicaps

Allen G. Sandler, Ph.D.
Susan McClain, R.P.T.

Old Dominion University
Norfolk, Virginia

A small, but growing body of literature suggests that noncontingent vestibular stimulation may have influences upon developmental parameters in a number of important areas. Although the effects of contingent vestibular input have not been well-researched, clinical experience suggests that it may be a potent form of sensory reinforcement.

Research involving the use of noncontingent vestibular stimulation with premature infants and nonhandicapped newborns and preambulatory infants has indicated:

1) vestibular stimulation has a significant pacifying effect (Korner & Thoman, 1972; Pederson & Ter Vrught, 1973).

2) increased levels of visual alertness (Korner & Grobstein, 1966; Korner & Thoman, 1970).

3) increased levels of visual, auditory, and motor responsiveness (Neil, 1968).

4) improved visual tracking (Gregg, Haffner, & Korner, 1976).

5) gains in cognitive & motor performance on the Bayley (Rice, 1977; Powell, 1974) Note: both tactile & vestibular input were provided in these studies. Barnard & Bee (1983) also recently reported cognitive gains on the Bayley.

6) gains in motor and reflex development - improvement in head, neck, and trunk control were noted, as well as gains in righting reactions (Clark, Kreutzberg, & Chee, 1977).

7) increased levels of smiling (Freedman & Boverman, 1966).

Research involving the use of noncontingent vestibular stimulation with handicapped children has shown:

1) increases in "looking" behavior, vertical head movements, and environmental contact among nonambulatory profoundly retarded individuals (Landesman-Dwyer & Sackett, 1978).

2) improved motor performance, in particular, in the area of head control, among preambulatory Down's children (Kantner, Clark, Allen, & Chase, 1976).

3) gains in motor and reflex development among young cerebral palsied children (Chee, Kreutzberg, & Clark, 1978).

4) decreased levels of self-injurious behavior among profoundly retarded persons (Wells & Smith, 1983). Note: both tactile & vestibular input were provided in this study.

Although everyday experience suggests that movement experiences are reinforcing, only a single study has been reported involving exploration of the reinforcing properties of contingently applied vestibular stimulation. Freeman, Frankel, and Ritvo (1976) found that both autistic children and children with mild to moderate retardation were reinforced by rocking at various frequencies.

A Study of the Relative Effectiveness of Vestibular Stimulation as a Reinforcer with Profoundly Retarded/Multiply Handicapped Children

The purpose of this investigation was to explore the relative reinforcing propertie of vestibular stimulation, compared to food reinforcement, praise, visual, and auditory reinforcement. Subjects were six nonambulatory children with profound retardation and cerebral palsy, ranging in age between six and nine years. The children were trained to manually operate a pressure sensitive adaptive switch which provided access to reinforcement. Following training, children were exposed sequentially to the followi reinforcers: a)music, b)praise, c)a multicolored pinwheel, d)food, and e)swinging in an adaptive swing (Community Playthings #E45). Music, visual, or vestibular stimulation were provided for 10 second intervals contingent upon each operation of the adaptive switch. Praise (e.g., "Good work, Good pressing the switch"), and food reinforcement were also provided contingent upon operation of the adaptive switch.

As indicated in Tables #1-6, vestibular stimulation was reinforcing for all children. Vestibular stimulation appeared to be a more potent reinforcer than the other reinforcers studied for four of the six subjects.

TABLE 1 SUBJECT #1

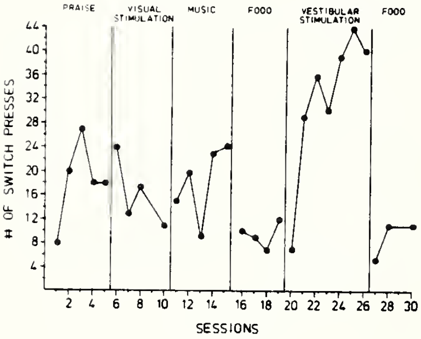


TABLE 2 SUBJECT #2

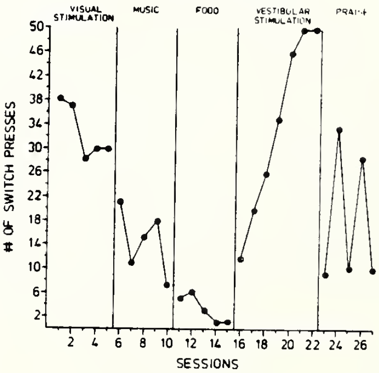


TABLE 3 SUBJECT #3

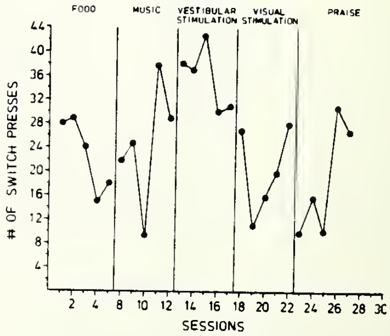


TABLE 4 SUBJECT #4

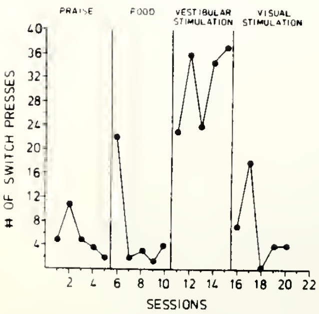


TABLE 5 SUBJECT #5

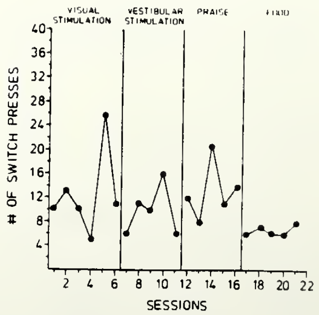
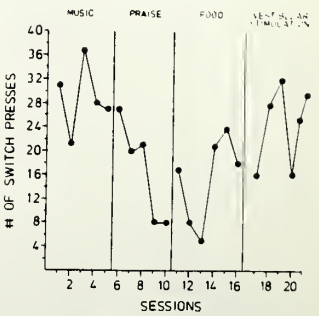


TABLE 6 SUBJECT #6



Survey of Ophthalmalogy, Volume 29, Number 5, March-April 1985

Abstract by Robert S. Baker
UK Medical Center, Lexington, Kentucky

Eye-Pressing by Visually Impaired Children, by J. E. Jan, R. D. Freeman, A.Q. McCormick, E.P. Scott, W.D. Robertson, and D.E. Newman, Developmental Medicine and Child Neurology 25:755-762, 1983.

Many children with visual impairments exhibit one or more types of self-injurious behavior, such as rocking, head-rolling, body-swaying, twirling, tapping, hand-flapping, eye-pressing, gazing at light, rapid blinking, waving their fingers between their eyes and a bright light, hyperventilation, sniffing, and a great variety of other stereotyped mannerisms. In this article the authors describe the various forms of visual self-stimulation and speculate about the neurophysiology, as well as summarize their results with children who demonstrate prolonged eye-pressing.

Eye-pressing depends on the onset of visual impairment, the age, the degree and quality of residual light, type of ocular abnormality, and the presence of additional handicaps. The authors note that children with bilateral optic nerve defects never press their eyes, whereas those with retinal disorders tend to press. Furthermore, the globes become sunken and air pockets lie between orbital rims and the overstretched soft tissue of the globe.

Visual self-stimulation is very difficult to stop and frequently parents are at a loss as to how to break the habit. Since visually impaired children tend to stimulate themselves mostly when they are bored, tired, or sleepy, introducing other activities to keep the hands busy diminishes the behavior. The physiologic demand for self-stimulation lessens with increased age; children do not press as intensely and they voluntarily suppress the habit because they are more concerned about conforming socially.

COMMENTS

Ophthalmologists have long asssumed that blind children press their eyes in order to induce phosphenes, fulfilling the drive to obtain visual sensations. However, the interpretation of eye-pressing in the broad context of the patient's disease process and behavior has not been simplified by their theory. Even casual observation has linked frequent eye-pressing with the repetitive mannerisms of the retarded or emotionally disturbed child. This paper does not remove the complexities in understanding this entity, but it provides useful information about eye-pressing unobtainable by observation of only occasional cases.

Of fundamental importance is the observation that **only visually impaired children engage in eye-pressing.** Although children with psychiatric and intellectual handicaps may hit their eyes (more frequently they will hit other parts of their face or head), they do not press unless there is an associated visual problem. All children who do exhibit the distinct mannerism of eye-pressing must be assumed to have a visual handicap. Understanding the abnormalities that are associated with eye-pressing is a more complex problem.

The authors' organization of the multitude of associated variables is uniquely useful. They characterized the **visually impaired children without mannerisms as tending to have useful sight, acquired ocular disorders, average intelligences, normal neurological examination, and no additional handicaps.** The corollary is that when eye-pressing is seen, all the above-mentioned associations must be thought of and looked for. The tendency to be associated with other abnormalities would tend to liken eye-pressing to other repetitive mannerisms seen in handicapped children. However, the authors point out that **visual self-stimulation is distinct from other mannerisms in that it is influenced mostly by early onset and severity of visual impairment and type of ocular pathology. In other words, a child who has the early onset of severe visual impairment of retinal origin is apt to engage in frequent intense eye-pressing even if his intellectual and neurological development is normal or near normal.** The authors offer a clinical pearl in the observation that **children blind from optic nerve or cortical disease never press their eyes and those with retinal disease have the highest incidence of pressing.**

These observations may be useful in a number of individual clinical situations. For instance, a blind child without evidence of associated abnormalities who is engaging in frequent and intense eye-pressing should be suspected of having a severe amount of visual impairment, and a retinal etiology should be looked for. On the other hand, **if a child with multiple handicaps and obvious severe visual impairment is not engaging in any eye-pressing, optic nerve or cortical disease should be suspected.** If a blind child has a sudden unexplained increase in the frequency and intensity of eye-pressing for no apparent reason, the clinician should recall that this behavior may reflect emotional stress and make appropriate inquiries.

It is interesting to note that **eye-pressing increases when a child is listening intently.** This is in contrast with other mannerisms which generally decrease with greater attention and further serves to remove this repetitive phenomenon from the large group of nonvisual mannerisms. There are several areas of the brain where information from the visual and auditory systems overlap. Phosphenes and even more complex visual experiences can be produces by sound, indicating the close linkage of these two senses which we usually consider to be separate. It may be that the production of phosphenes increases the child's ability to attend to aural stimulation by changing the electrical activity in one of these overlapping association areas.

Documentation of the soft tissue and bony abnormalities that my be produced by long-term intense eye-pressing raises the question of what can be done to alter this behavior. The authors correctly point out that the problem is a difficult one. Attention to the child's emotional needs and encouragement to keep active will be the most fruitful maneuvers.

1/2/2015
337264 5 10 00
HF GROUP - IN